

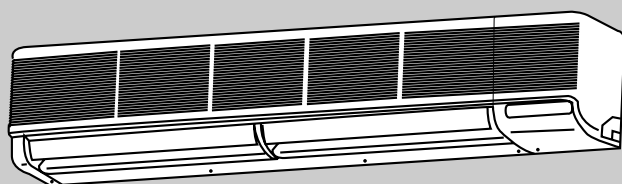
# TECHNICAL & SERVICE MANUAL

## Series PKH Wall Mounted

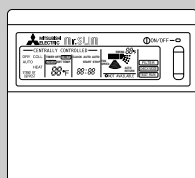
[Models] **PKH18FK3**  
**PKH24FK3**  
**PKH30FK3**  
**PKH36FK3**

**Revision:**

- The wrong descriptions in REFRIGERANT SYSTEM DIAGRAM have been modified. (Page 21.)
- The wrong descriptions in WIRING DIAGRAM have been modified. (Page 22.)
- Restrictor valve and capillary tube have been added to "Specifications" of heat exchanger. (Page 58.)
- Please void OC273.



Indoor unit



Remote controller

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**Mr. SLIM™**

# 1

## TECHNICAL CHANGE

**PKH18FK<sub>2</sub> → PKH18FK3**

**PKH24FK<sub>2</sub> → PKH24FK3**

**PKH30FK<sub>2</sub> → PKH30FK3**

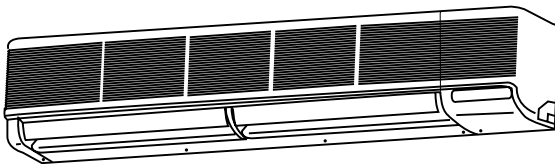
**PKH36FK<sub>2</sub> → PKH36FK3**

● INDOOR CONTROLLER BOARD has changed.

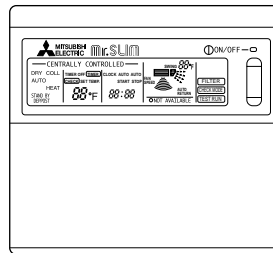
- 1) From TRANSFORMER to POWER BOARD.
- 2) From JUMPER CONNECTOR (J1) to DIP SWITCH (SW1).
- 3) From JUMPER CONNECTOR (J5) to DIP SWITCH (SW5).
- 4) The number of switches of SW7 changed from 4 to 3 pieces.
- 5) SW8 for option and SW9 for model selector are added.

# 2

## FEATURES



Indoor unit



Remote controller

Models	Cooling capacity / Heating capacity	SEER
PKH18FK3	18,000 / 18,600 [25,100] Btu/h	11.1
PKH24FK3	24,000 / 25,000 [31,500] Btu/h	10.2
PKH30FK3	30,000 / 33,000 [40,500] Btu/h	10.6
PKH36FK3	34,200 / 38,000 [45,500] Btu/h	10.5

### 1. COMPACT DESIGN

The PKH series models have been downsized and now require such minimal wall space that they can even be installed above windows. For the PKH-FK3, 14.5in of wall space between the ceiling and the window allows “above window” installation.

### 2. AUTO FLAP SHUTTER

With a simple flick of the OFF switch the air outlet will be closed off with a shutter. The shutter also functions as a flap during operation to adjust the air flow angle, with “Auto Angle 1” securing a comfortable air flow.

### 3. INSTALLATION : FAST AND ENDLESSLY ADAPTABLE

#### (1) Multi-directional piping

Multi directional drain and refrigerant piping radically improves flexibility in selecting installation layouts. PKH-FK3 models boast refrigerant piping in 4 directions and drain piping in 2 directions.

#### (2) Back plate installation guide

The back plate installation guide gives clear instructions on installation positions. The enlarged back plate secures the unit firmly to the wall, while the support piece which lifts the unit makes left side piping work much easier.

#### (3) Easily removable filter

The presence of thumbscrews on the filters means that the filters can be quickly and smoothly removed.

## 4. ADVANCED MICROPROCESSOR

### (1) Easy to Use Microprocessor

#### 1) Ultra-Thin Remote Controller

The streamlined, wide controller is designed to blend with any kind of interior and the adoption of a sophisticated microprocessor allows you to carry out a wide range of operations easily.

#### 2) Attractive Liquid Crystal Display (LCD)

Units operation mode, set temperature, room temperature, timer setting, fan speed, and air flow direction are displayed on the remote controller with the easily understood visual Liquid Crystal Display (LCD).

#### 3) Convenient 24-Hour ON-OFF Timer

The timer allows Mr.SLIM to be switched on or off automatically at the time is shown on the LCD.

#### 4) Self-Diagnostic Feature Indicates Instantly

In the rare case when a problem occurs, the unit stops operating and the set temperature indicator changes to the self-diagnostic indicator, indicating the location of the fault.

If the check switch is pressed twice, the unit stops operating and the check mode is initiated. The cause of the most recent problem stored in the memory is displayed on the LCD. This is extremely useful for maintenance purposes.

#### 5) Useful Memory Feature for Storing Instructions

The previous set value is memorised so that constant temperature control can be obtained. This is convenient when, for example, a power failure occurs.

### (2) Non-polar Two-Wire Remote Controller Cables

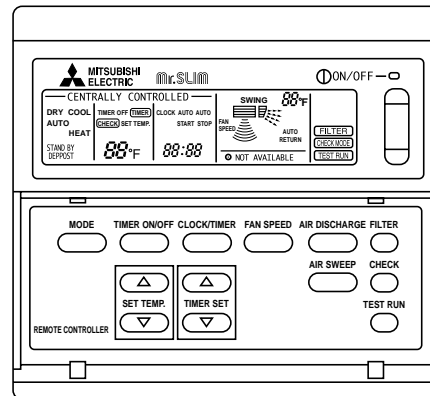
The non-polar, two-wire type remote controller cable is slim, installation is simple and trouble-free. Remote controller wire can be extended up to 550 yards.

### (3) Automatic Cooling / Heating Changeover Operation

An automatic cooling and heating changeover operation system is provided to ensure easy control and year-round air conditioning.

Once the desired temperature is set, unit operation is switched automatically between cooling and heating, in accordance with the room temperatures as low as 75°F.

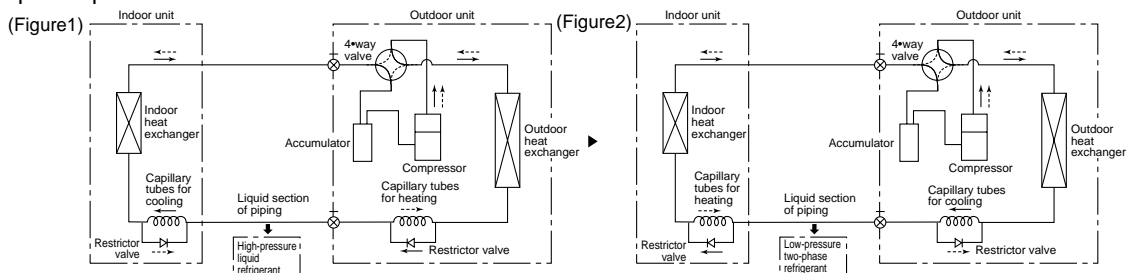
[Remote controller]



## 5. READY-CHARGED REFRIGERANT SYSTEM

### PRE-CHARGE REFRIGERANT REQUIRED FOR LINE LENGTH OF 100ft AT SHIPMENT. PREVENTING TROUBLES DUE TO SHORTAGE OF REFRIGERANT.

The unique refrigerant circuit and a large accumulator always controls the refrigerant to its optimum condition regardless of the length of 164ft maximum. The additional refrigerant charging work at the field which often caused uncertain problems heretofore is completely eliminated. This unique system serves to improve the quality of work and reliability, and also helps to speed up the installation work.



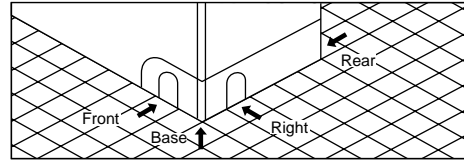
With normal circulation systems, a high-pressure refrigerant, condensed for cooling by the outdoor heat exchanger, is reduced in pressure by capillary tubes in the indoor unit after passing through the restrictor valve in the outdoor unit (see Figure 1). With the new circulation system, the direction of the restrictor valve is reversed as shown in Figure 2, and the condensed high pressure refrigerant is reduced in pressure by the capillary tubes in the outdoor unit. This results in a "two-phase refrigerant" of reduced pressure in the liquid section of the piping. The density of this two-phase refrigerant is 1/3~1/2 of that of the high pressure liquid refrigerant, and thus is required in smaller amounts (see Figures 1 and 2). As a result, the length of the piping can be extended further, and the effects of height differences are reduced. These new circulation system are also equipped with a large accumulator which allows the refrigerant required for the 100ft piping length to be enclosed in the outdoor unit. The result is an air conditioner that requires no charging unless piping is extended beyond 100ft.

## 6. HIGH RELIABILITY AND EASY SERVICING

In addition to the self-diagnostic function, units are also equipped with a 3-minute time delay mechanism (cooling), an auto restart function, an emergency operation function, a test run switch, etc., to assure high reliability and easy servicing.

## 7. FOUR-WAY PIPING ACCESS MAKES INSTALLATION LAYOUT EASY

Piping on the outdoor unit may be connected from either of four directions: front, rear, side or beneath the base. This easy-access design makes it possible to install a number of units in a compact arrangement at a single site. The outdoor unit allows for unheard-of flexibility in determining a piping layout, thus greatly simplifying installation.



## 8. FRONT-ACCESS FACILITATES MAINTENANCE

The outdoor unit has been designed with a front access service panel that allows easy access to all maintenance point, regardless of the installation layout. What's more, this front panel may be removed by loosening only two screws. It all adds up to greatly simplified maintenance work.

## 9. NITROGEN GAS IS CHARGED TO INDOOR UNIT

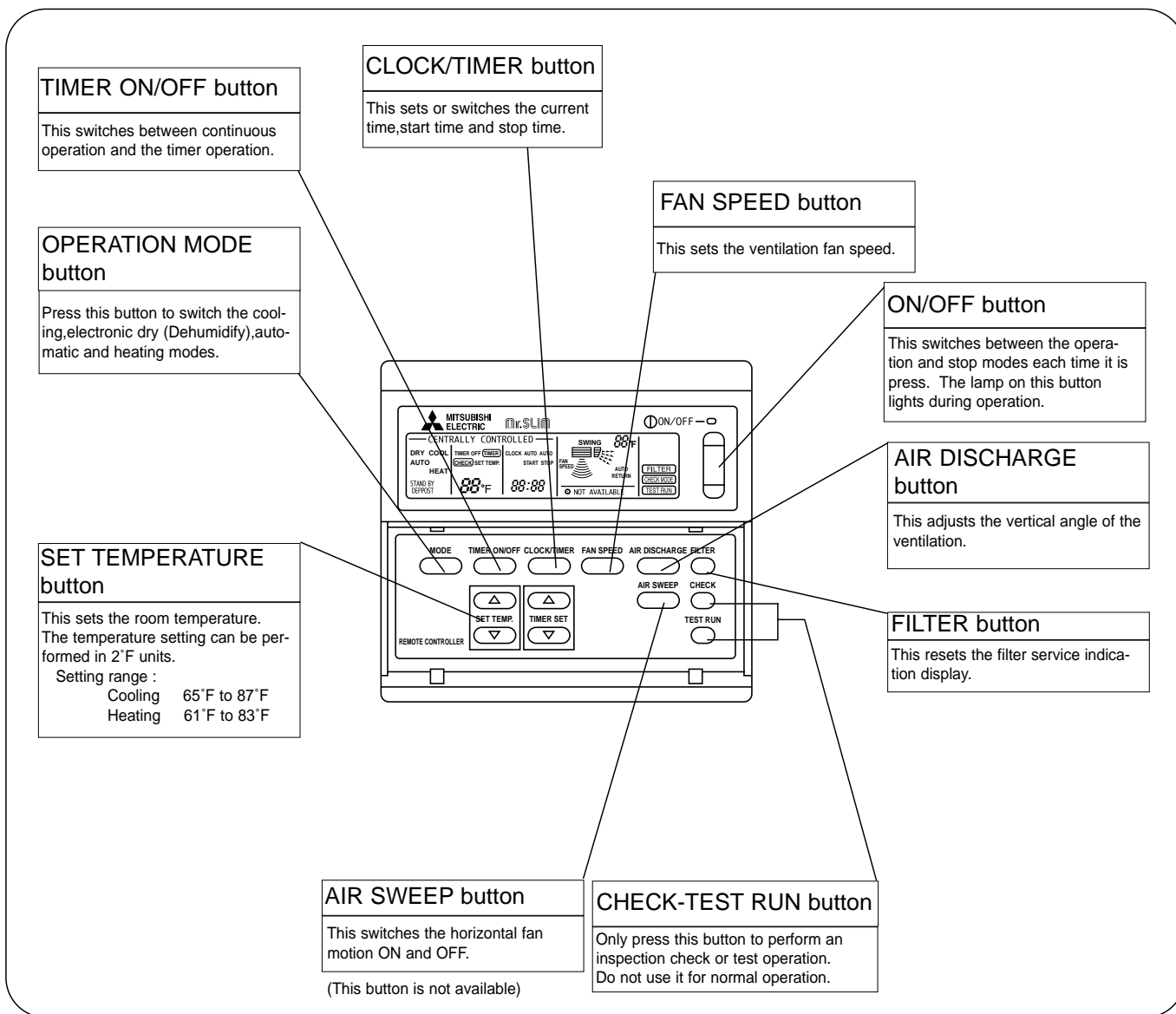
Indoor unit and refrigerant pipes are charged with nitrogen gas (N<sub>2</sub>) instead of R-22 before shipment from the factory.

## Remote controller

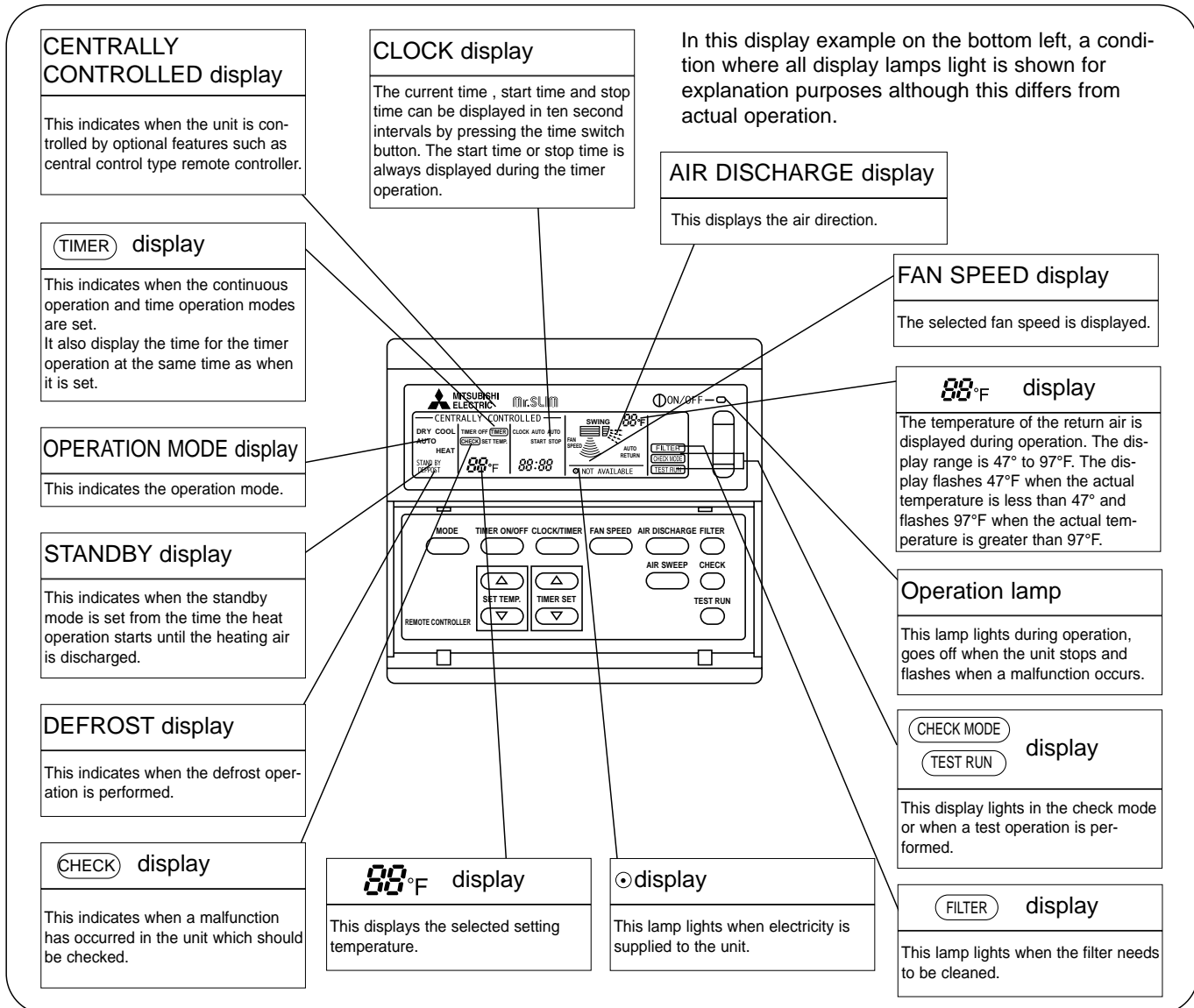
Settings remain in effect until changed.

Air conditioner can be operated by simply pushing ON/OFF button once settings have been made.

## Remote controller operation buttons



## Remote controller display



### Caution

- Only the ⊙ display lights when the unit is stopped and power supplied to the unit.
- When power is turned ON for the first time the (CENTRAL CTRL) display appears to go off momentarily but this is not a malfunction.
- When the central control remote control unit, which is sold separately, is used the ON-OFF button, OPERATION MODE button and SET TEMP button do not operate.
- "NOT AVAILABLE" is displayed when the AIR SWEEP button are pressed.  
(AIR SWEEP function is not provided for PKH series.)

## 4

## SPECIFICATIONS

## MODELS : PKH18FK3, PKH24FK3, PKH30FK3, PKH36FK3

Model			PKH18FK3	PKH24FK3	PKH30FK3	PKH36FK3
Capacity	Cooling *1	Btu/h	18,000	24,000	30,000	34,200
	Heating *1	Btu/h	18,600[24,100/25,100]	25,000[30,500/31,500]	33,000[39,100/40,500]	38,000[44,100/45,500]
	Heating *2	Btu/h	10,700[16,200/17,200]	14,700[20,200/21,200]	19,000[25,100/26,500]	19,600[25,700/27,100]
Moisture removal		Pints/h	5.3	7.0	9.1	10.5
Power Consumption	Cooling *1	kW	1.79	2.36	3.12	3.44
	Heating *1	kW	1.56[3.16/3.46]	2.37[3.97/4.27]	3.02[4.82/5.22]	3.54[5.34/5.74]
	Heating *2	kW	1.34[2.94/3.24]	1.92[3.52/3.82]	2.48[4.28/4.68]	2.65[4.45/4.85]
EER		*1	10.1	10.2	9.6	9.9
SEER			11.1	10.2	10.6	10.5
HSPF			7.2	6.8	7.1	6.9
COP	*1		3.5	3.1	3.2	3.1
	*2		2.3	2.2	2.2	2.2
INDOOR UNIT MODELS			PKH18FK3	PKH24FK3	PKH30FK3	PKH36FK3
External finish			Munsell 3.4Y 7.7/0.8			
Power supply			V,phase,Hz			
Max.fuse size (time delay)			A			
Min.ampacity			A			
Fan motor			F.L.A.			
Booster heater			A(kW)			
Airflow Hi-Lo	Dry	CFM	710-530		990-780	
	Wet	CFM	640-480		890-700	
Sound level Hi-Lo		dB	48 -41		49-44	50-46
Unit drain pipe O.D.		in.	1-1/16 (or 7/8)			
Dimensions	W	in.	55-1/8		66-5/32	
	D	in.	9-1/4			
	H	in.	13-3/8			
Weight		lb	57	57	66	66
OUTDOOR UNIT MODELS			PUH18EK	PUH24EK <sub>1</sub>	PUH30EK <sub>1</sub>	PUH36EK <sub>1</sub>
External finish			Munsell 5Y 7/1			
Power supply			V,phase,Hz			
Max.fuse size (time delay)			A			
Min.ampacity			A			
Fan motor			F.L.A.			
Compressor	Model (type)		RH247NAB	NH33NBD	NH41NAD	NH47NAD
	R.L.A.		12	11.5	14.0	17.5
	L.R.A.		37	54	73	87
Crankcase heater		A(W)	0.11/0.12[23/28]	0.16/0.17[33/39]	0.16/0.17[33/39]	0.16/0.17[33/39]
Refrigerant control			Capillary tube			
Defrost method			Reverse cycle			
Sound level		dB	53	55	55	55
Dimensions	W	in.	34-1/4		38-3/16	38-3/16
	D	in.	11-5/8		13-9/16	13-9/16
	H	in.	33-1/2	49-9/16	49-9/16	49-9/16
Weight		lb	131	202	245	246
REMOTE CONTROLLER			With indoor unit			
Control voltage (by built-in transformer)			Indoor unit-remote controller:DC12V. Indoor unit-outdoor unit:DC12V			
REFRIGERANT	Name		R22			
	Charge		5 lbs 8 oz	9 lbs 15 oz	10 lbs 2 oz	10 lbs 9 oz
	Oil <Model>		L	0.52 <MS-56>	1.2 <MS32N-1>	1.3 <MS32N-1>
REFRIGERANT PIPING			Not supplied(optional parts)			
Pipe size	Liquid	in.	3/8		1/2	
	Gas	in.	5/8		3/4	
Connection method	Indoors		Flared			
	Outdoors		Flared			
Between the indoor & outdoor units	Height difference		ft	130		
	Piping length		ft	130		

NOTES : \*1.Rating conditions (cooling)-indoor : DB 80°F, WB 67°F outdoor : DB 95°F, WB 75°F.

(heating)-indoor : DB 70°F, WB 60°F outdoor : DB 47°F, WB 43°F.

\*2.Rating conditions (heating)-indoor : DB 70°F, WB 60°F outdoor : DB 17°F, WB 15°F.

\*3.Heating capacity and power consumption in [ ] includes heater operation at 208/230V.

## Operating range

		Indoor intake air temperature	Outdoor intake air temperature
Cooling	Maximum	DB 95°F, WB 71°F	DB 115°F
	Minimum	DB 67°F, WB 57°F	DB 0°F *
Heating	Maximum	DB 80°F, WB 67°F	DB 75°F, WB 65°F
	Minimum	DB 70°F, WB 60°F	DB 17°F, WB 15°F

\* In case of the wind baffle is installed.

(In case of the wind baffle is not installed, the minimum temperature will be DB 23°F.)

# **MODELS : PKH18FK3, PKH24FK3, PKH30FK3, PKH36FK3**

## **1. PERFORMANCE DATA**

### **1) COOLING CAPACITY**

Models	Models		Outdoor intake air DB temperature(°F)														
	Airflow (CFM) B.F	IWB (°F)	75			85			95			105			115		
			TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC	TC	SHC	TPC
PKH18FK3	$\frac{710}{0.16}$	71	21.0	14.4	1.56	20.2	13.9	1.69	19.4	13.3	1.84	18.5	12.7	1.99	17.6	12.1	2.15
		67	19.5	16.0	1.52	18.8	15.4	1.65	18.0	14.8	1.79	17.1	14.0	1.93	16.3	13.4	2.07
		63	18.2	17.4	1.49	17.5	16.7	1.61	16.8	16.0	1.74	15.9	15.2	1.88	15.1	14.4	2.01
	DB 75°F (50%RH)	62.5	18.1	15.5	1.49	17.4	14.9	1.61	16.6	14.3	1.74	15.8	13.6	1.87	15.0	12.9	2.00
	DB 72°F (50%RH)	60	17.2	15.1	1.47	16.6	14.5	1.58	15.8	13.8	1.70	15.0	13.1	1.84	14.2	12.4	1.96
	DB 70°F (50%RH)	59	16.8	14.5	1.46	16.2	14.0	1.57	15.5	13.4	1.69	14.6	12.6	1.83	13.9	12.0	1.94
PKH24FK3	$\frac{710}{0.16}$	71	27.9	16.1	2.05	26.9	15.5	2.23	25.8	14.9	2.43	24.6	14.2	2.63	23.4	13.5	2.84
		67	26.1	18.5	2.01	25.1	17.8	2.18	24.0	17.0	2.36	22.9	16.3	2.55	21.7	15.4	2.73
		63	24.3	20.5	1.97	23.4	19.7	2.12	22.4	18.9	2.30	21.3	18.0	2.47	20.1	17.0	2.65
	DB 75°F (50%RH)	62.5	24.1	18.0	1.96	23.2	17.4	2.12	22.2	16.6	2.29	21.1	15.8	2.47	19.9	14.9	2.64
	DB 72°F (50%RH)	60	23.0	17.6	1.94	22.1	16.9	2.09	21.1	16.2	2.25	20.1	15.4	2.41	18.9	14.5	2.58
	DB 70°F (50%RH)	59	22.5	17.0	1.93	21.7	16.4	2.07	20.7	15.6	2.24	19.7	14.9	2.39	18.5	14.0	2.56
PKH30FK3	$\frac{990}{0.15}$	71	34.9	21.5	2.72	33.7	20.8	2.95	32.3	19.9	3.21	30.8	19.0	3.48	29.3	18.1	3.75
		67	32.6	24.5	2.66	31.4	23.6	2.88	30.0	22.5	3.12	28.6	21.5	3.37	27.1	20.3	3.61
		63	30.4	26.9	2.60	29.2	25.8	2.81	27.9	24.6	3.04	26.6	23.5	3.27	25.1	22.2	3.50
	DB 75°F (50%RH)	62.5	30.2	23.8	2.59	29.0	22.9	2.80	27.7	21.9	3.03	26.3	20.7	3.26	24.9	19.6	3.49
	DB 72°F (50%RH)	60	28.8	23.2	2.57	27.6	22.2	2.77	26.3	21.2	2.99	24.9	20.1	3.21	23.5	18.9	3.43
	DB 70°F (50%RH)	59	28.2	22.4	2.56	27.0	21.5	2.76	25.7	20.4	2.98	24.4	19.4	3.19	22.9	18.2	3.41
PKH36FK3	$\frac{990}{0.14}$	71	39.8	23.0	3.00	38.4	22.1	3.25	36.8	21.2	3.54	35.1	20.2	3.83	33.4	19.3	4.13
		67	37.1	26.3	2.93	35.7	25.3	3.17	34.2	24.3	3.44	32.6	23.1	3.71	30.9	21.9	3.98
		63	34.7	29.3	2.87	33.3	28.1	3.10	31.9	26.9	3.35	30.3	25.6	3.61	28.7	24.2	3.86
	DB 75°F (50%RH)	62.5	34.4	25.8	2.86	33.1	24.8	3.09	31.6	23.7	3.34	30.0	22.5	3.59	28.4	21.3	3.85
	DB 72°F (50%RH)	60	32.8	25.1	2.82	31.5	24.1	3.04	30.1	23.0	3.28	28.5	21.8	3.52	26.9	20.6	3.76
	DB 70°F (50%RH)	59	32.2	24.3	2.81	30.8	23.2	3.03	29.5	22.3	3.26	27.9	21.0	3.50	26.4	19.9	3.73

Notes 1. B.F. : Bypass Factor, IWB : Intake air wet-bulb temperature

TC : Total Capacity (x10<sup>3</sup> Btu/h), SHC : Sensible Heat Capacity (x10<sup>3</sup> Btu/h)

TPC : Total Power Consumption (kW)

2. SHC is based on 80°F DB of indoor intake air temperature.

3. Cooling capacity correction factors and Refrigerant piping length (one way) range.

MODEL	Refrigerant piping length (one way)									
	25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PKH18FK3	1.0	0.992	0.983	0.978	0.966	0.959	0.950	0.945	—	—
PKH24FK3	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PKH30FK3	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874
PKH36FK3	1.0	0.981	0.968	0.952	0.940	0.925	0.913	0.900	0.886	0.874



## 2) HEATING CAPACITY

Models	Models		Outdoor intake air WB temperature(°F)												Auxiliary heater (208V 230V)	
	Airflow (CFM)	IWB (°F)	15		25		35		45		55		65			
			CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC	CA	PC
PKH18FK3	710	75	12.1	1.20	14.1	1.34	16.3	1.49	18.7	1.65	21.4	1.83	23.7	1.99	5.5	1.6
		70	12.4	1.16	14.4	1.29	16.7	1.44	19.1	1.59	21.8	1.76	24.1	1.91	-----	-----
		65	12.7	1.11	14.7	1.24	17.0	1.38	19.5	1.53	22.2	1.69	24.5	1.83	6.5	1.9
PKH24FK3	710	75	16.3	1.82	18.9	2.03	21.9	2.27	25.2	2.51	28.8	2.77	32.8	3.01	5.5	1.6
		70	16.6	1.76	19.4	1.96	22.4	2.19	25.7	2.42	29.3	2.67	33.3	2.90	-----	-----
		65	17.0	1.69	19.8	1.89	22.9	2.10	26.2	2.32	29.9	2.56	33.9	2.78	6.5	1.9
PKH30FK3	990	75	21.5	2.32	25.0	2.59	28.9	2.89	33.2	3.20	38.0	3.53	43.2	3.86	6.1	1.8
		70	21.9	2.24	25.5	2.50	29.6	2.78	33.9	3.08	38.6	3.40	43.7	3.72	-----	-----
		65	22.5	2.15	26.1	2.40	30.2	2.68	34.6	2.96	39.4	3.26	44.6	3.56	7.5	2.2
PKH36FK3	990	75	24.7	2.71	28.7	3.04	33.3	3.39	38.2	3.75	43.7	4.14	49.6	4.49	6.1	1.8
		70	25.3	2.62	29.4	2.93	34.1	3.26	39.0	3.61	44.5	3.98	50.4	4.28	-----	-----
		65	25.9	2.53	30.1	2.82	34.8	3.14	39.9	3.47	45.4	3.83	51.3	4.14	7.5	2.2

Notes 1. IDB : Intake air dry-bulb temperature

CA : Capacity (x10<sup>3</sup> Btu/h), PC : Power Consumption (kW)

2. When booster heater is "on", total capacity and total power consumption should be added the figures described in booster heater column.

•Booster heater ON : When the set temperature is higher than the room temperature by more than 5.4 deg.

•Booster heater OFF : When the set temperature is higher than the room temperature by less than 3.6 deg.

3. Heating capacity correction factors.

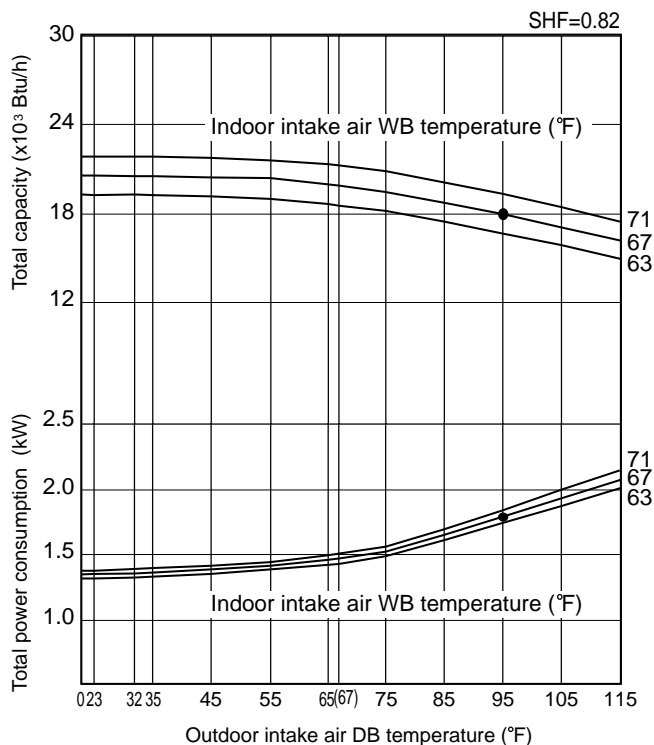
Models	Refrigerant piping length (one way)		
	Less than 100ft	100~130ft	130~164ft
PKH18FK3	1.00	0.995	0.990
PKH24FK3	1.00	0.995	0.990
PKH30FK3	1.00	0.995	0.990
PKH36FK3	1.00	0.995	0.990

## 2. PERFORMANCE CURVE

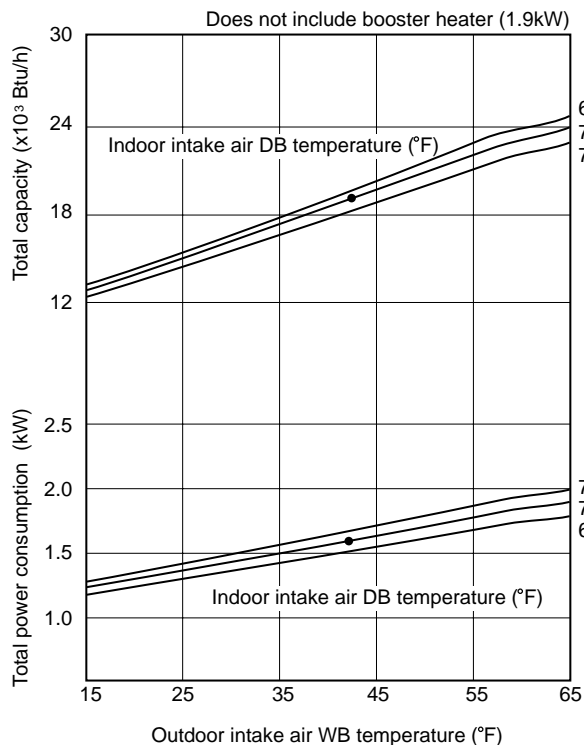
NOTES : A point on the curve shows the reference point.

<PKH18FK3>

### COOLING CAPACITY

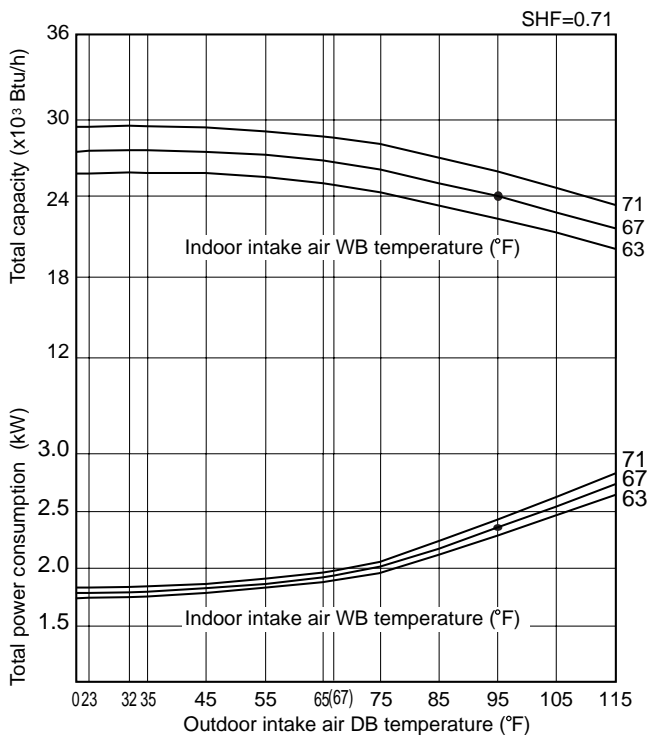


### HEATING CAPACITY

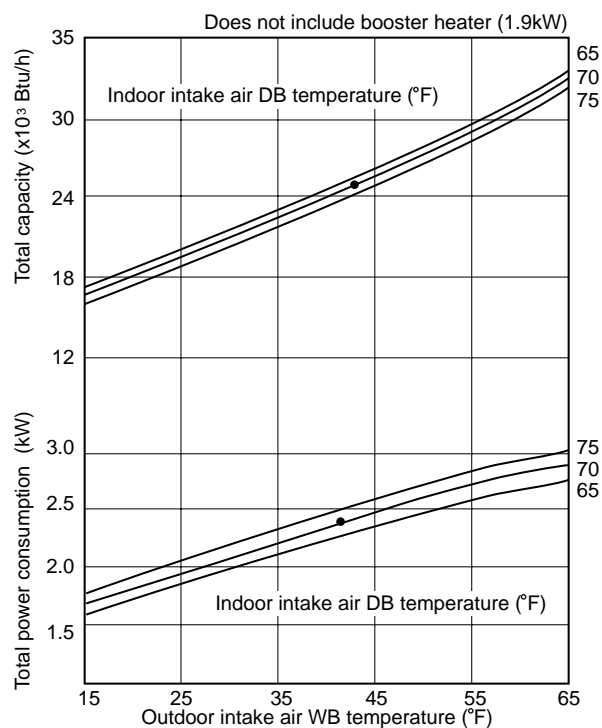


<PKH24FK3>

### COOLING CAPACITY



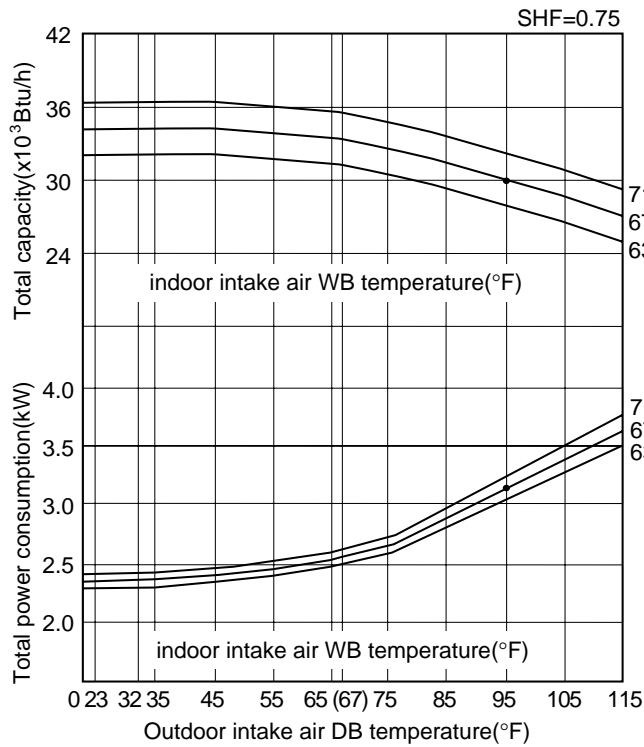
### HEATING CAPACITY



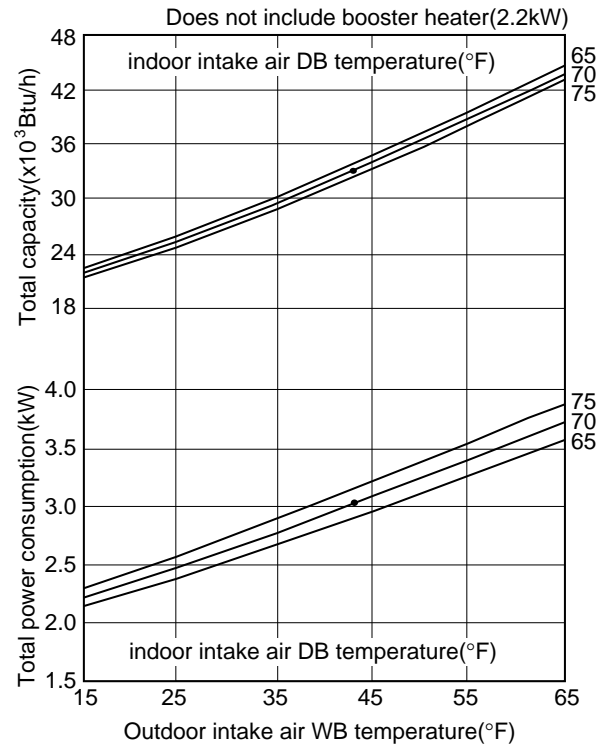
NOTES : A point on the curve shows the reference point.

### <PKH30FK3>

#### COOLING CAPACITY

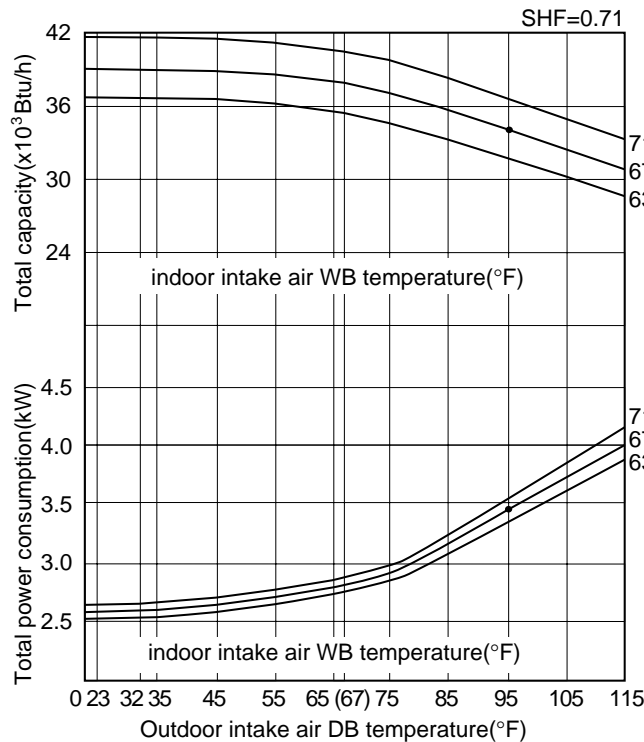


#### HEATING CAPACITY

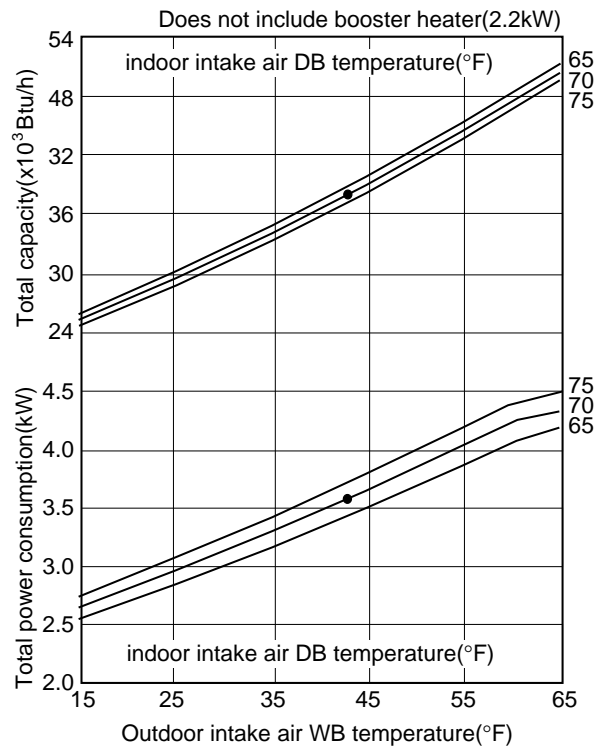


### <PKH36FK3>

#### COOLING CAPACITY



#### HEATING CAPACITY



### 3. CONDENSING PRESSURE AND SUCTION PRESSURE

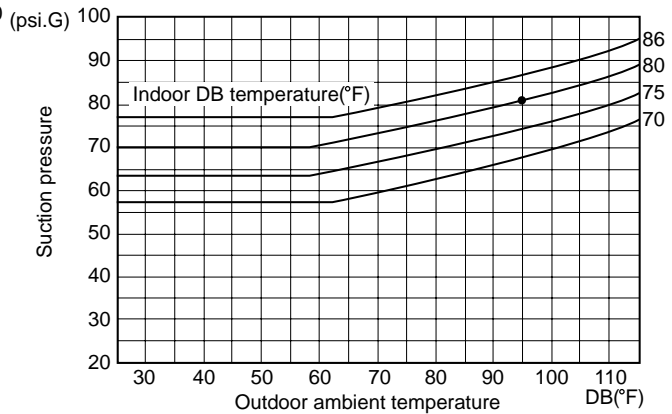
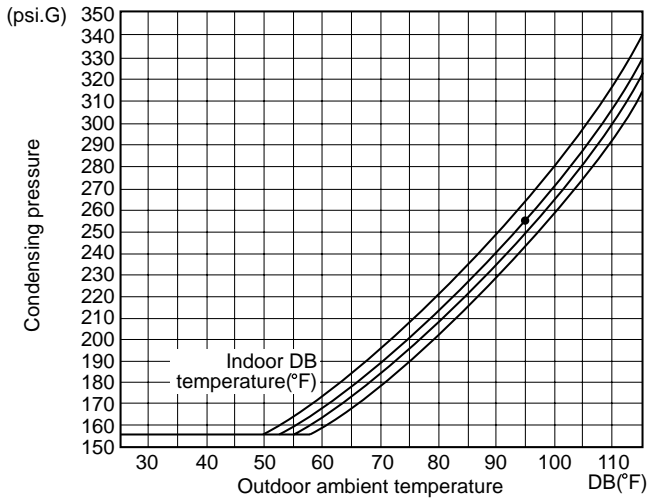
Data is based on the condition under indoor humidity 50%.

Air flow should be set at HI.

A point on the curve shows the reference point.

<PKH18FK3>

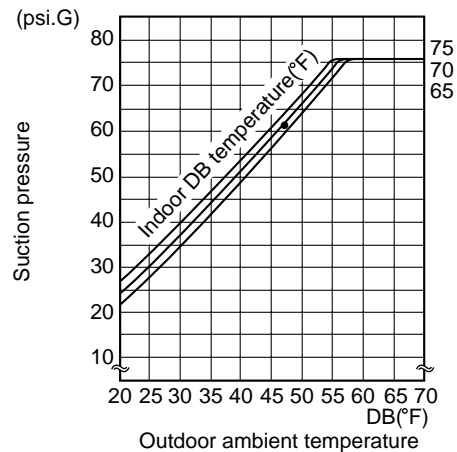
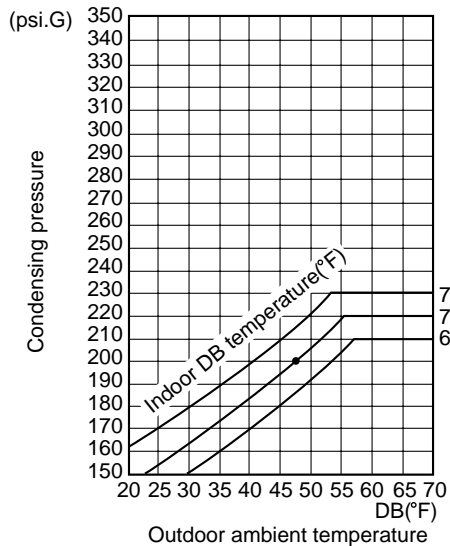
#### COOLING MODE



Data is based on the condition under outdoor humidity 75%.

A point on the curve shows the reference point.

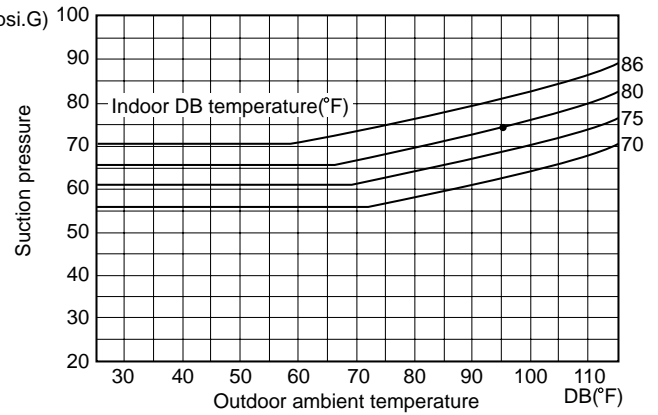
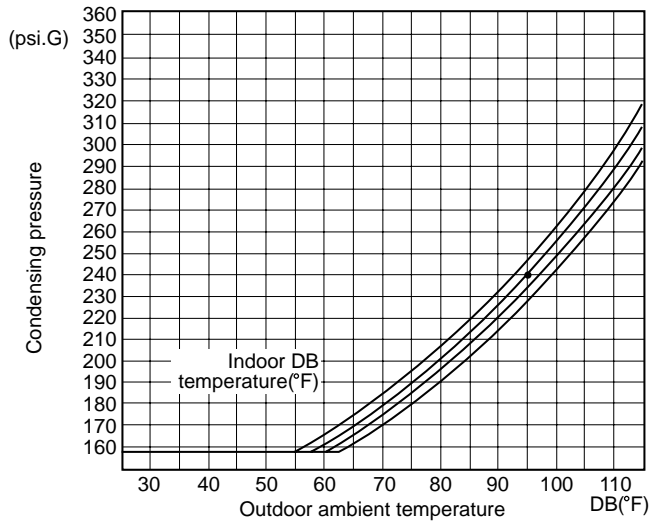
#### HEATING MODE



Data is based on the condition under indoor humidity 50%.  
 Air flow should be set at HI.  
 A point on the curve shows the reference point.

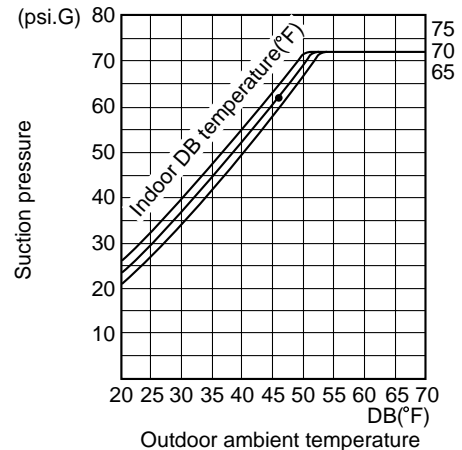
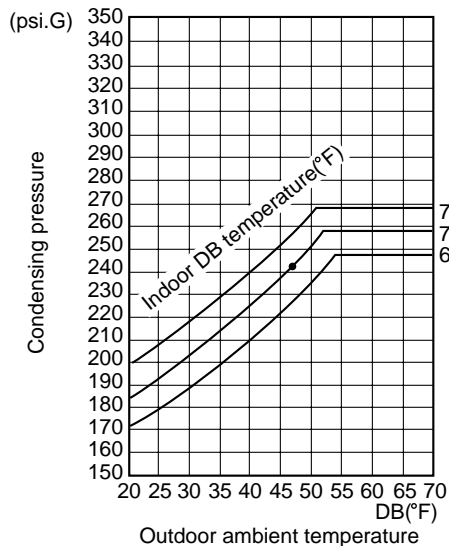
### <PKH24FK3>

#### COOLING MODE



Data is based on the condition under outdoor humidity 75%.  
 A point on the curve shows the reference point.

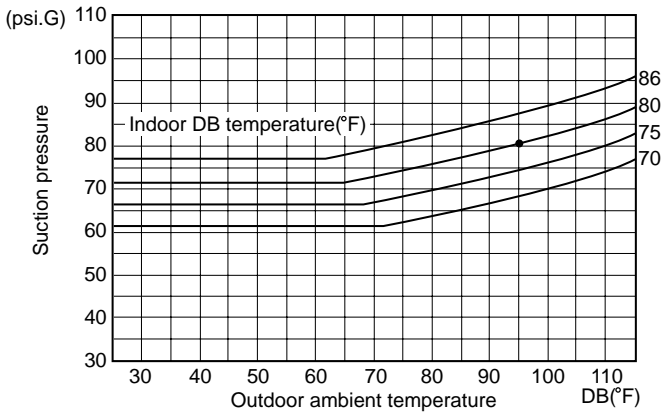
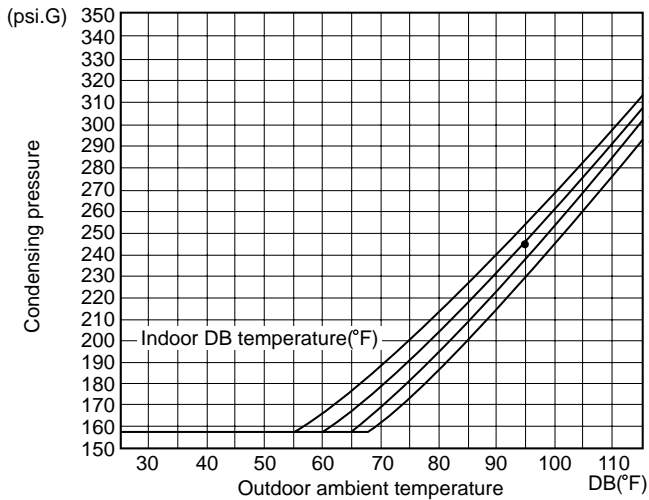
#### HEATING MODE



Data is based on the condition under indoor humidity 50%.  
 Air flow should be set at HI.  
 A point on the curve shows the reference point.

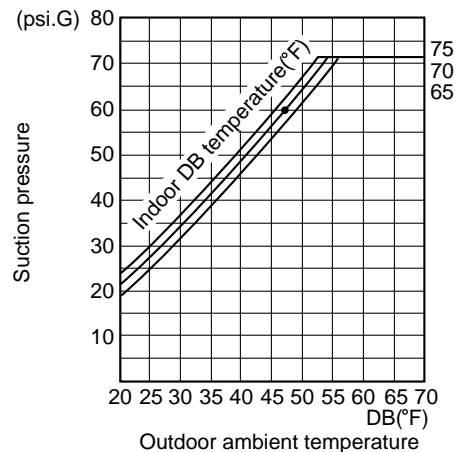
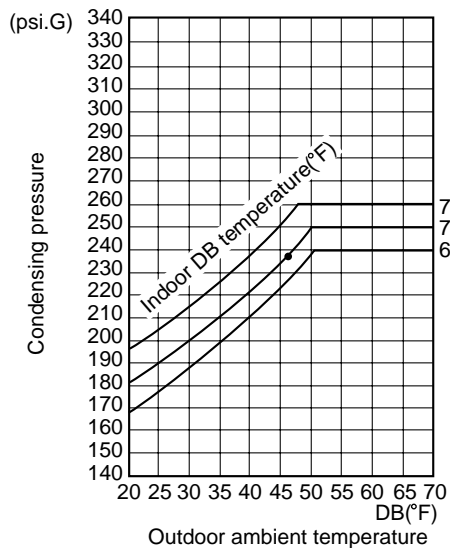
### <PKH30FK3>

#### COOLING MODE



Data is based on the condition under outdoor humidity 75%.  
 A point on the curve shows the reference point.

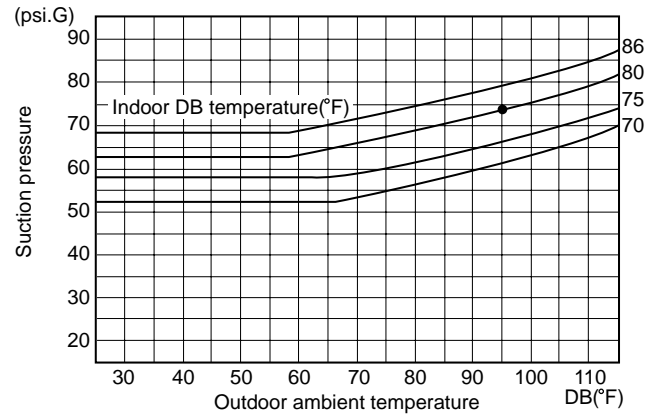
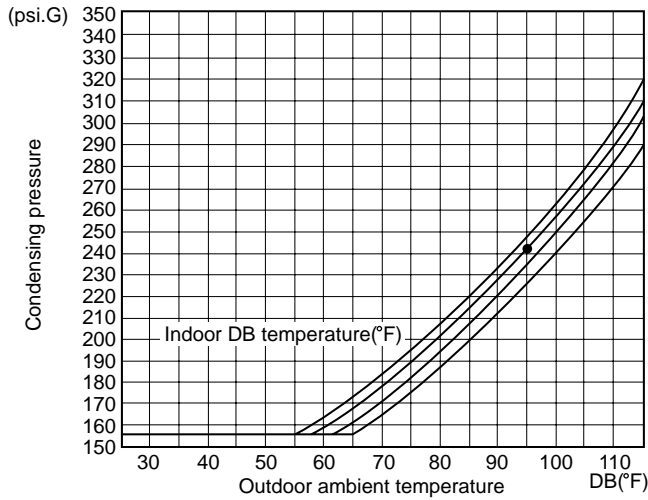
#### HEATING MODE



Data is based on the condition under indoor humidity 50%.  
 Air flow should be set at HI.  
 A point on the curve shows the reference point.

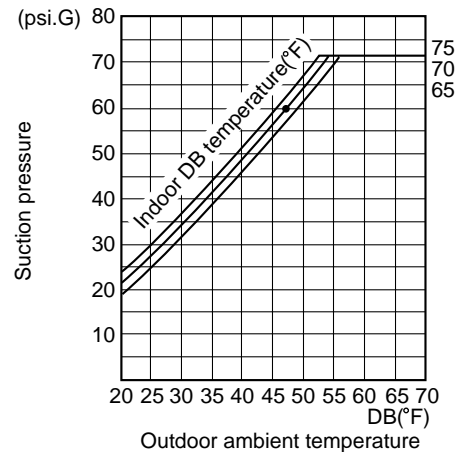
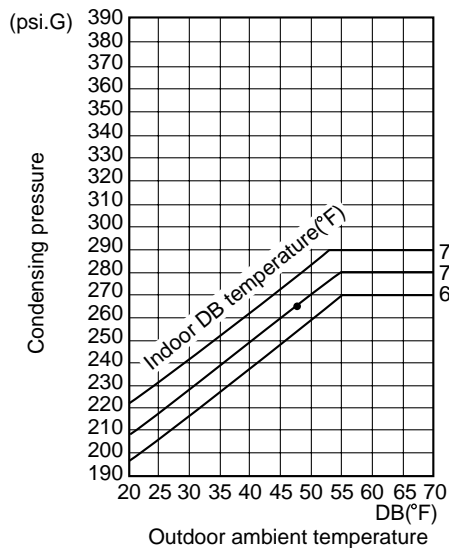
### <PKH36FK3>

#### COOLING MODE



Data is based on the condition under outdoor humidity 75%.  
 A point on the curve shows the reference point.

#### HEATING MODE



#### 4. STANDARD OPERATION DATA

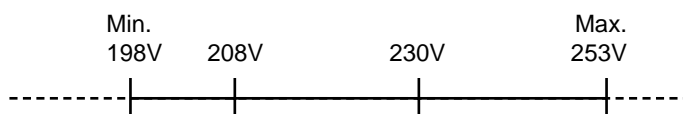
Models			PKH18FK3		PKH24FK3		PKH30FK3		PKH36FK3		
Item		Unit	Cooling	Heating	Cooling	Heating	Cooling	Heating	Cooling	Heating	
Electrical circuit	Voltage	V	208/230	208/230	208/230	208/230	208/230	208/230	208/230	208/230	
	Frequency	Hz	60		60		60		60		
	Total input	kW	1.79	1.56	2.36	2.37	3.12	3.02	3.44	3.54	
	Indoor fan current	A	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	
	Booster heater current	A	—	7.6/8.4	—	7.6/8.4	—	8.7/9.6	—	8.7/9.6	
	Outdoor fan current	A	0.75	0.75	0.65+0.65	0.65+0.65	0.75+0.75	0.75+0.75	0.75+0.75	0.75+0.75	
	Comp. current	A	7.4/6.9	6.1/5.9	9.3/8.7	9.5/8.7	12.6/11.8	12.2/11.4	14.3/13.2	14.7/13.7	
Refrigerant circuit	Condensing pressure	psi.G	255	202	240	243	245	236	243	263	
	Suction pressure	psi.G	81	61	75	63	80	60	74	60	
	Discharge temperature	°F	182	126	158	149	158	159	160	170	
	Condensing temperature	°F	118	102	115	115	115	113	115	120	
	Suction temperature	°F	66	34	46	35	49	32	45	33	
	Comp.shell bottom temperature	°F	171	111	141	126	138	130	142	148	
	Ref. pipe length	ft	25		25		25		25		
	Refrigerant charge	—	5 lbs 8 oz		9 lbs 15 oz		10 lbs 2 oz		10 lbs 9 oz		
Indoor side	Intake air temperature	DB	°F	80	70	80	70	80	70	80	70
		WB	°F	67	60	67	60	67	60	67	60
	Discharge air temperature	DB	°F	61	96	58	105	59	103	58	109
		WB	°F	59	68	56	70	58	70	56	71
	Fan speed	r.p.m.	1,310		1,310		1,400		1,400		
	Airflow (High)	CFM	710		710		990		990		
Outdoor side	Intake air temperature	DB	°F	95	47	95	47	95	47	95	47
		WB	°F	75	43	75	43	75	43	75	43
	Fan speed upper/lower	r.p.m.	790		750/750		760/760		760/760		
	Airflow	CFM	1,590		3,170		3,350		3,350		
Capacity		Btu/h	18,000	18,600	24,000	25,000	30,000	33,000	34,200	38,000	
SHF		—	0.82	—	0.71	—	0.75	—	0.71	—	



## 5. OPERATING RANGE

### 1) POWER SUPPLY

1 Phase 60Hz 208/230V  
Guaranteed voltage range



### 2) OPERATION

Function	Air intake temperature Condition	Indoor		Outdoor	
		DB(°F)	WB(°F)	DB(°F)	WB(°F)
Cooling	Standard temperature	80	67	95	75
	Maximum temperature	95	71	115	—
	Minimum temperature	67	57	*0	—
	Maximum humidity	80	75	80	75
Heating	Standard temperature	70	60	47	43
	Maximum temperature	80	67	75	65
	Minimum temperature	70	60	17	15

\* With wind baffle DB 23°F if on wind baffle.

## 6. OUTLET AIR SPEED AND COVERAGE RANGE

Model	Airflow (CFM)	Air speed (ft/sec)	Coverage range(ft)
PKH18FK3	710	16.1	41
PKH24FK3	710	16.1	41
PKH30FK3	990	17.7	50
PKH36FK3	990	17.7	50

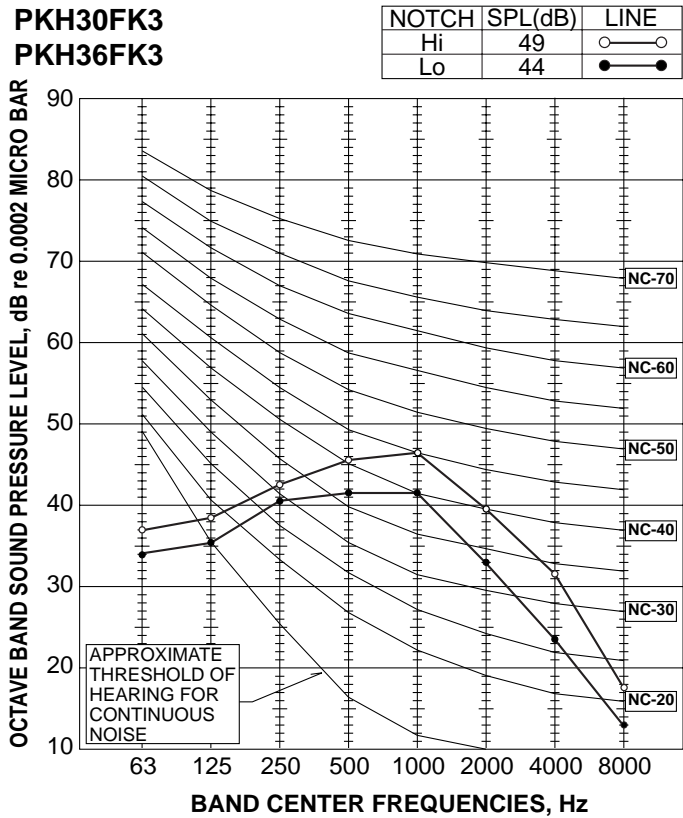
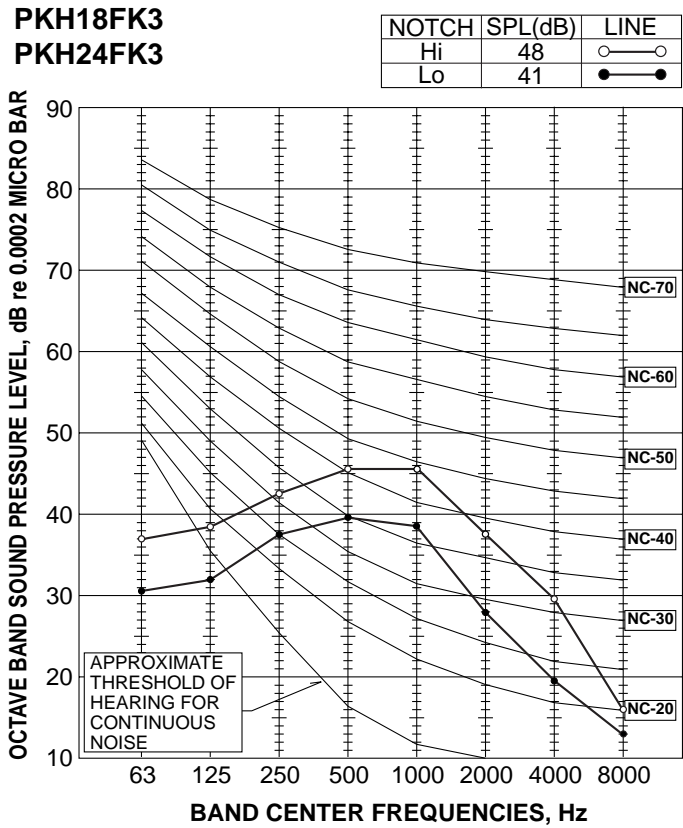
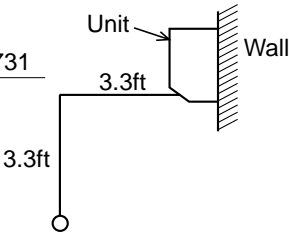
The air coverage range is the value up to the position where the air speed is 0.8ft/sec. when air is blown out horizontally from the unit at the High notch position. The coverage range should be used only as a general guideline since it varies according to the size of the room and furniture installed inside the room.

## 7. ADDITIONAL REFRIGERANT CHARGE (R22(oz))

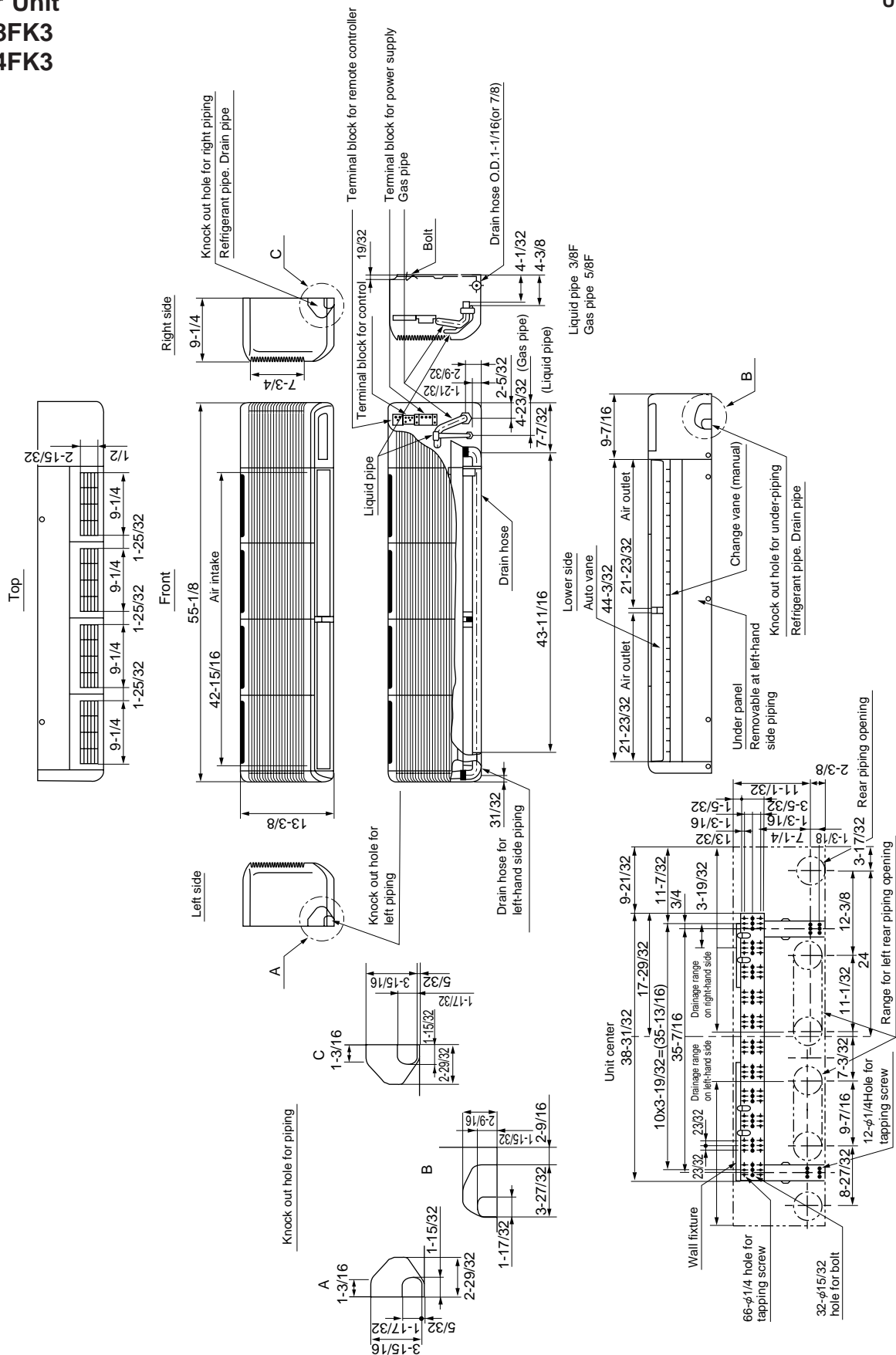
Model	Outdoor unit precharged (up to 100ft)	Refrigerant piping length (one way)									
		25ft	40ft	55ft	70ft	85ft	100ft	115ft	130ft	150ft	164ft
PKH18FK3	5 lbs 8 oz	0	0	0	0	0	0	2	4	—	—
PKH24FK3	9 lbs 15 oz	0	0	0	0	0	0	2	4	7	9
PKH30FK3	10 lbs 2 oz	0	0	0	0	0	0	5	10	16	20
PKH36FK3	10 lbs 9 oz	0	0	0	0	0	0	5	10	16	20

8. NOISE CRITERION CURVES

Ambient temperature 80°F  
Test conditions are based on JIS Z8731

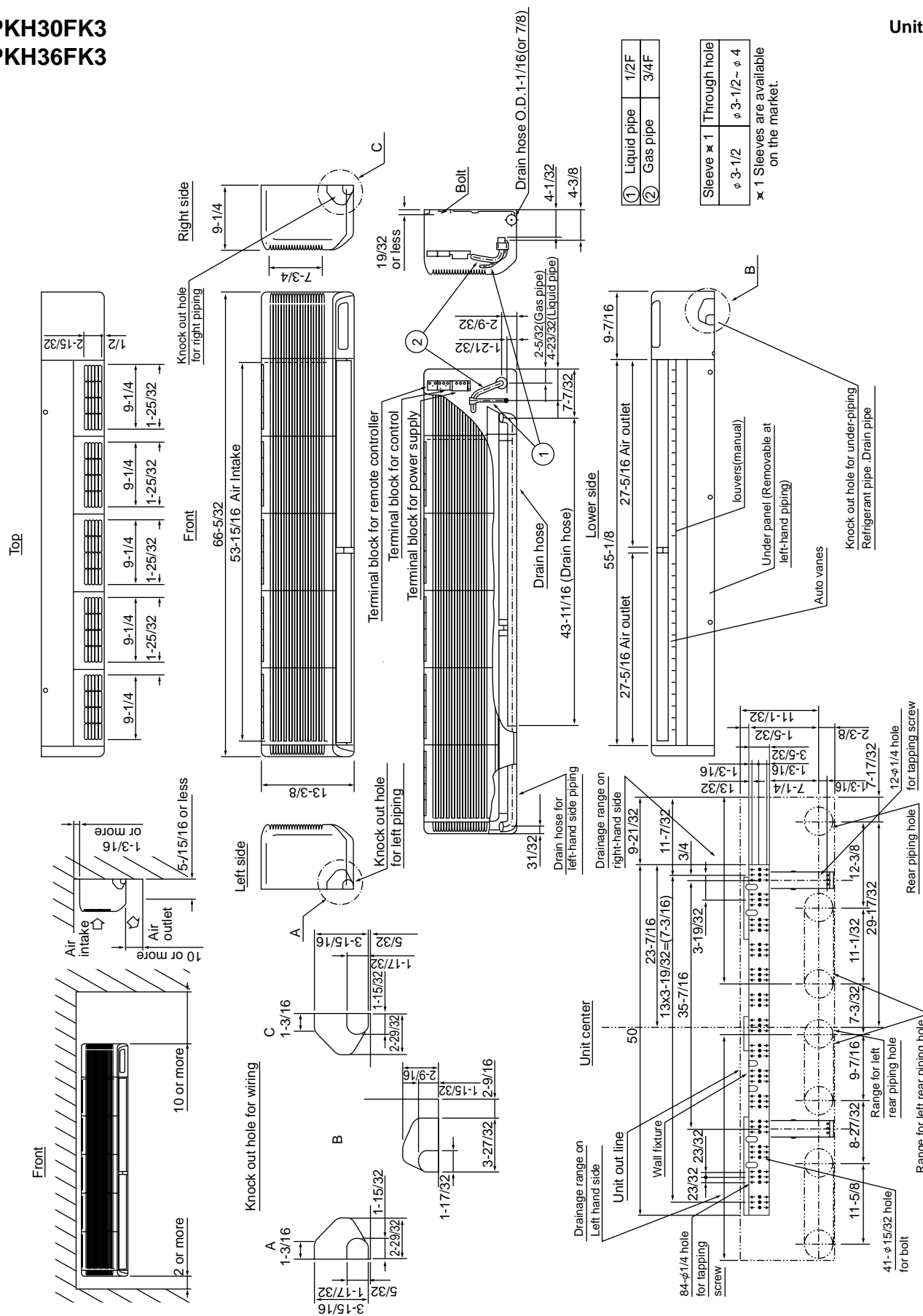


Unit : inch



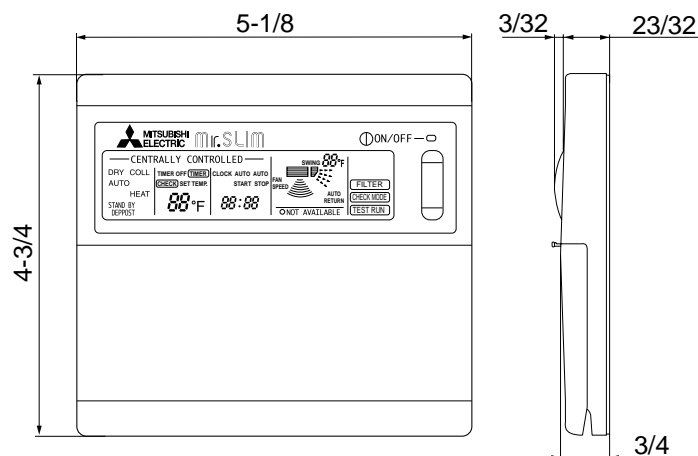
**PKH30FK3**  
**PKH36FK3**

Unit : inch



## Remote controller

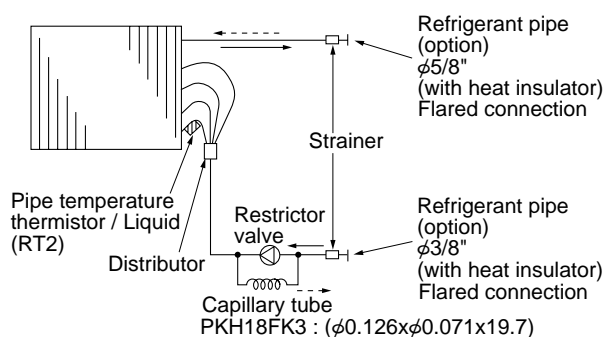
Unit : inch



## 7

## REFRIGERANT SYSTEM DIAGRAM

### PKH18FK3

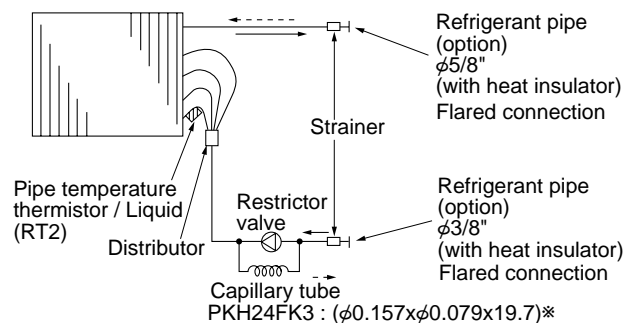


Refrigerant flow

← - - - - - HEATING

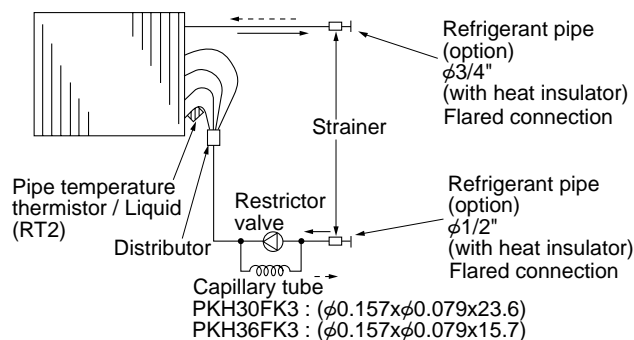
← - - - - - COOLING

### PKH24FK3

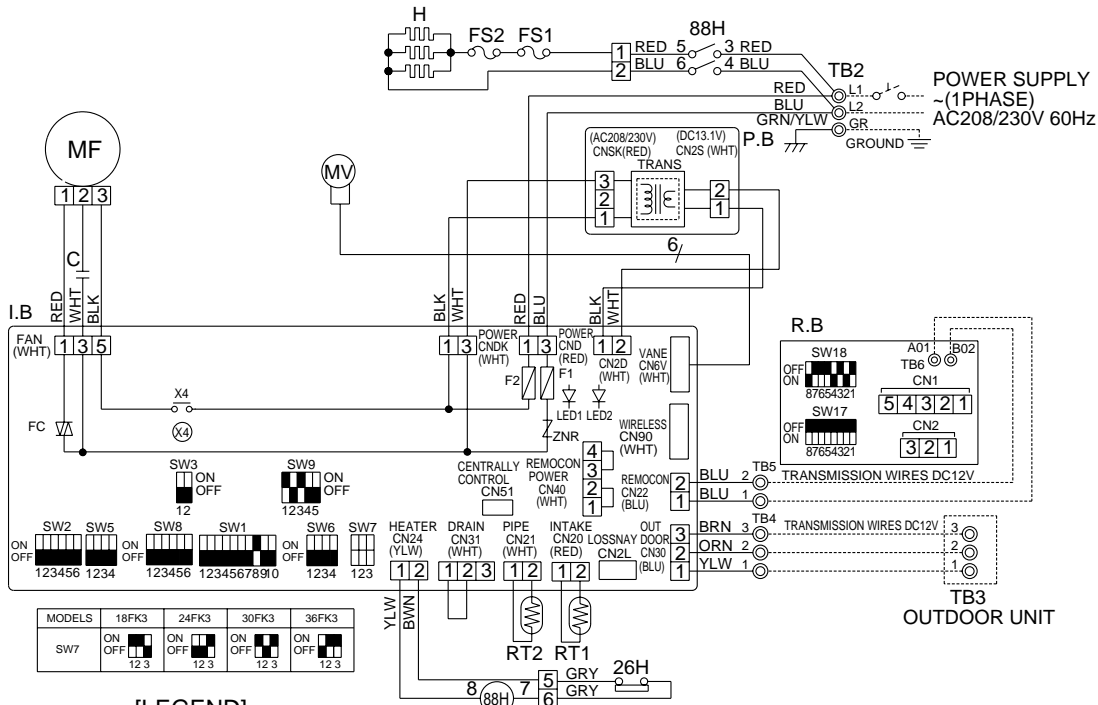


\* An error in this diagram has been modified. The size of capillary tube φ0.157xφ0.071x19.7, was wrong.

### PKH30FK3 PKH36FK3



## MODELS PKH18FK3, PKH24FK3, PKH30FK3, PKH36FK3 WIRING DIAGRAM



## NOTES:

- Since the indoor fan motor(MF)is connected with 230V power, if 208V power is used, change the dip switch(SW8)on the indoor controller board as shown in fig:\*1.

fig:\*1

Indoor fan motor(MF)for 208V.



- Since the outdoor side electric wiring may change be sure to check the outdoor unit electric wiring for servicing.
- Indoor and outdoor connecting wires are made with polarities, make wiring matching
- Symbols used in wiring diagram above are, :Connector, :Terminal block.
- Emergency operation

If remote controller or microcomputer fails but there is no other trouble emergency operation is possible by setting dip switch(SW3<I.B>) on the indoor controller board.

## [Check items]

- Make sure that no other trouble exist in the outdoor unit.Trouble with the outdoor unit prevents emergency operation.  
(If any trouble exists the outdoor unit error code"P8"will be displayed on the remote controller and the trouble position will be shown on the outdoor controller board LED. See electric wiring diagram of the outdoor unit for details.)
- Make sure that there is no trouble with the indoor fan.

Emergency operation will be continuous run with the power ON/OFF(ON/OFF with the remote controller is not possible).

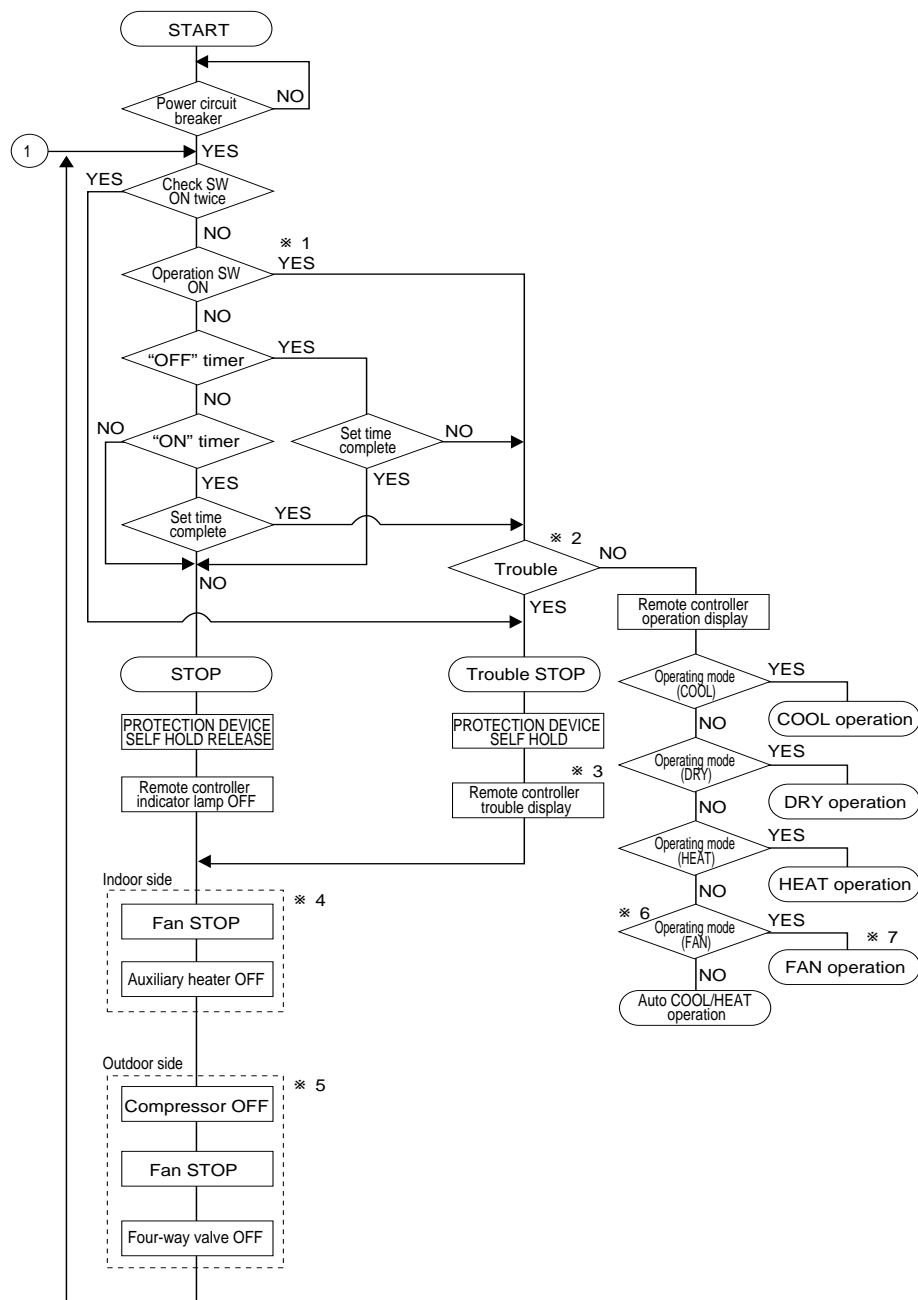
## [Emergency operation procedure]

- Set the dip switch(SW3<I.B>)on the indoor controller board to **1** on and **2** off for cooling and **1** • **2** on for heating.
- Turn on outdoor unit side circuit breaker,then indoor unit side circuit breaker.
- During emergency operation indoor fan runs at high speed but auto-vane does not work.
- Thermostat will not function.Cold air blows out for defrosting during heating thus do not operate defrosting for a long time.
- Emergency cooling should be limited to 10 hours maximum
- After every emergency operation,set all dip switches(SW3<I.B>) to OFF.
- Movement of the vanes does not work in emergency operation,therefore you have to slowly set them manually to the appropriate position.

RG79J691H02

The drawing has been revised as some errors in WIRING DIAGRAM have been modified.  
The former drawing number is RG79J691H01.

## MAIN OPERATION



※1 In addition, the centralised control and remote control can be operated.

※2 The modes which indicate the sources of trouble are listed below.

- E0-Signal transmitting/receiving error
- P1-Room temperature thermistor malfunction
- P2-Indoor coil thermistor malfunction
- P4-Drain sensor malfunction
- P5-Drain overflow
- P6-Coil frost/overheat protection
- P7-System error
- P8-Outdoor unit trouble

※3 The CHECK switch will show if an error has occurred in the past.

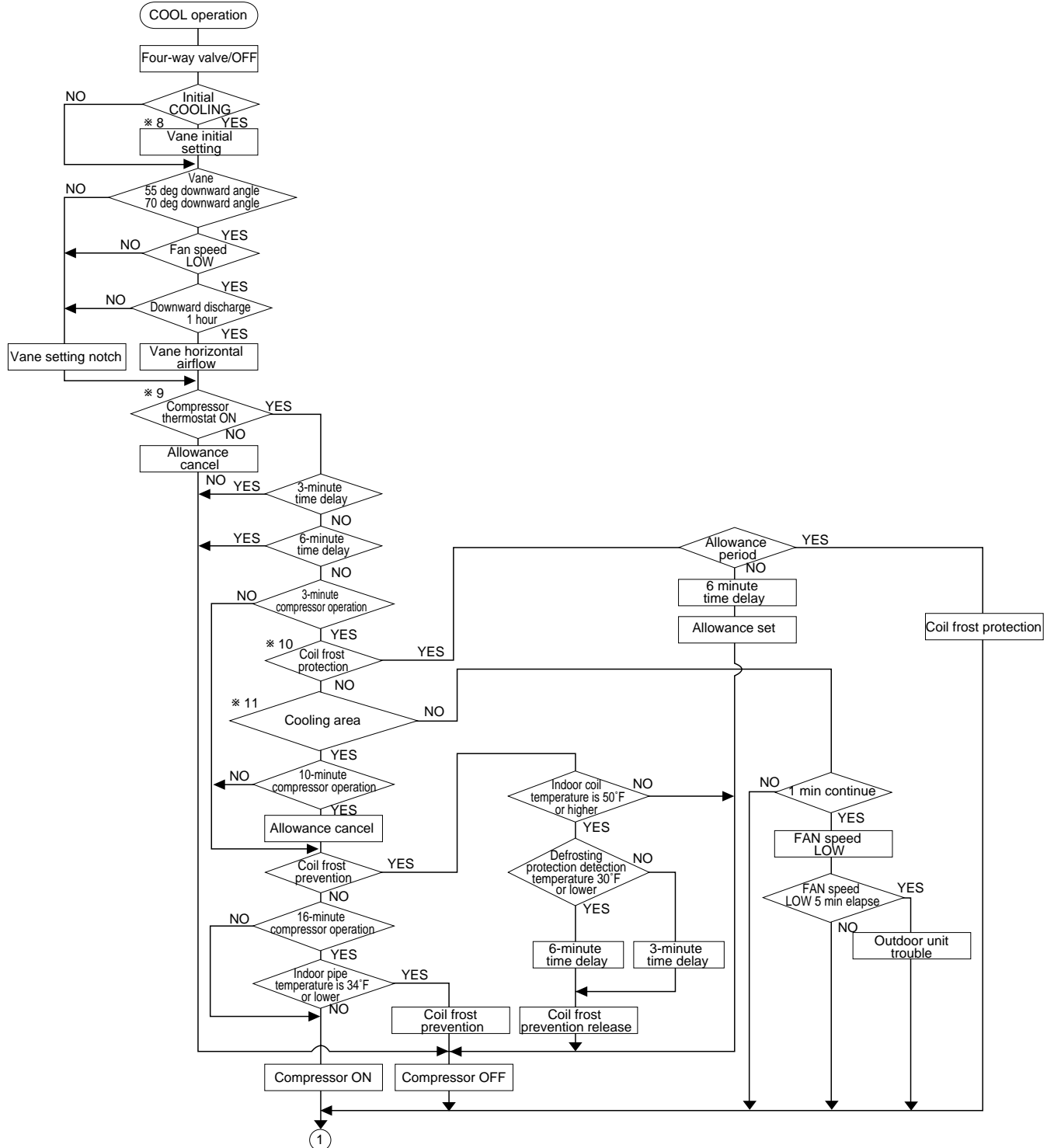
※4 Fan runs on low speed for 1 minute in order to remove overheat air.

※5 The 3-minute (6 minutes ... heating mode) time-delay functions after compressor stops.

※6 FAN or AUTO mode is selected by the indoor dip switch setting.

※7 In FAN mode, fan speed and vane operation depend on the remote controller setting. (Compressor is OFF.)

## COOLING OPERATION



※8 When operation stops or changes to cooling or dry mode, the auto vane turns to a horizontal angle. If operation changes during auto vane SWING, the auto vane will continue to swing.

※9 When operating TEST RUN, the thermostat will be continuously ON.

※10 After 3 minute compressor operation, if the indoor coil thermistor reads 5°F or below for 3 minutes, the compressor will stop for 6 minutes.

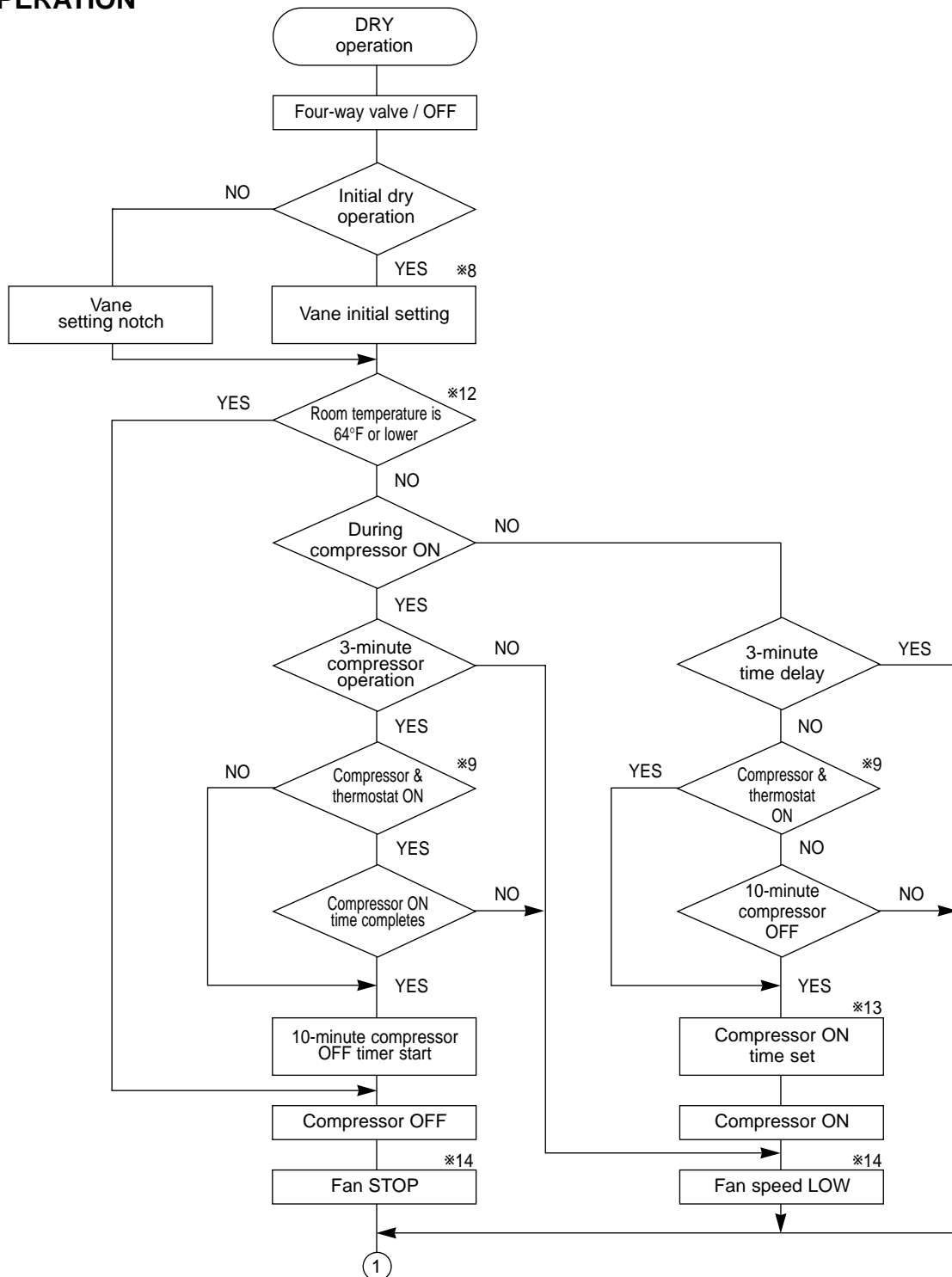
※11 Heating area : Indoor coil temperature is more than 9 degrees above the room temperature.

Cooling area : Indoor coil temperature is more than 9 degrees below the room temperature.

FAN area : Indoor coil temperature is within 9 degrees either way of the room temperature.



## DRY OPERATION



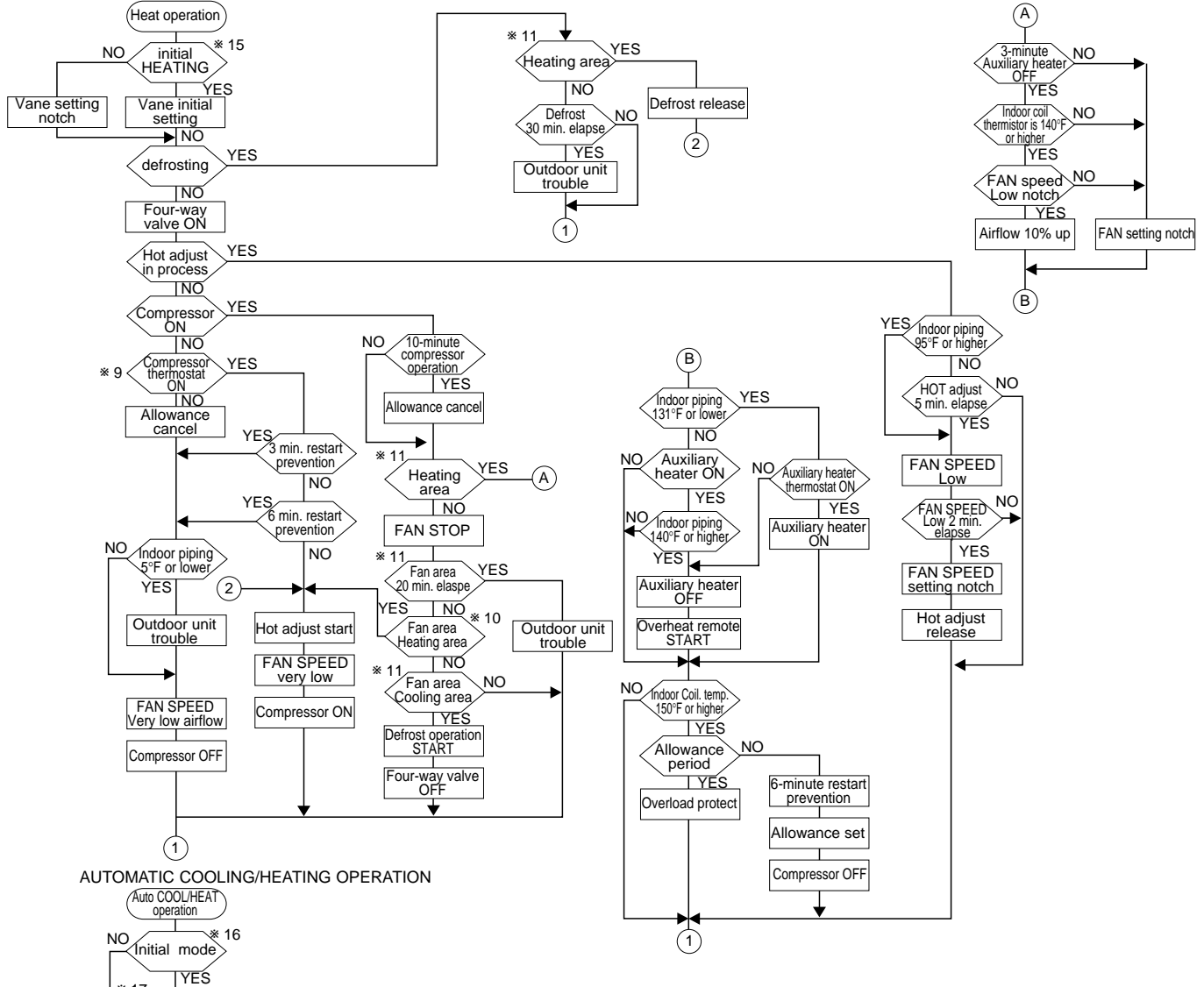
\*8—9 Refer to page OC273-24.

\*12 When room temperature is 64°F or below, the compressor cannot operate.  
When room temperature rises over 64°F the compressor starts after a 3-minute time delay.

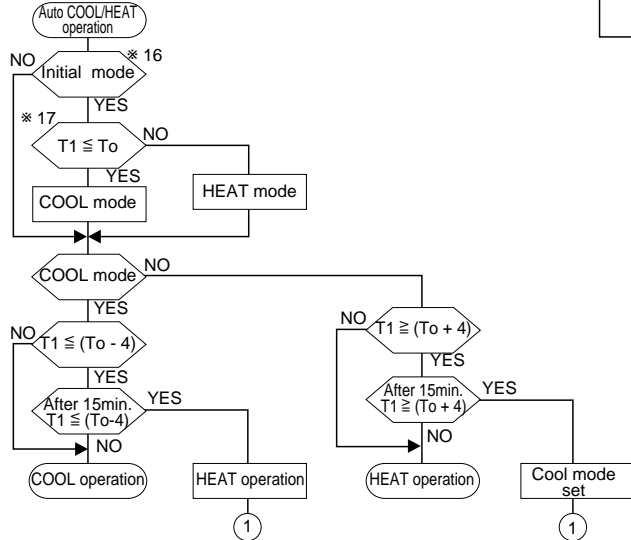
\*13 Compressor ON time is decided by room temperature. Refer to page OC273-32.

\*14 In dry operation, compressor ON makes the fan speed LOW. Also, when the compressor OFF and the pipe temperature is 79°F or less, the fan stops, or when the compressor OFF and the pipe temperature is below 43°F the fan speed changes to LOW mode.  
It is not possible to set the fan speed with the remote controller.

## HEATING OPERATION



## AUTOMATIC COOLING/HEATING OPERATION



- \*15 (i) Until Low airflow is set while in hot adjustment  
(ii) While defrosting (FAN STOP)  
(iii) When thermostat is OFF

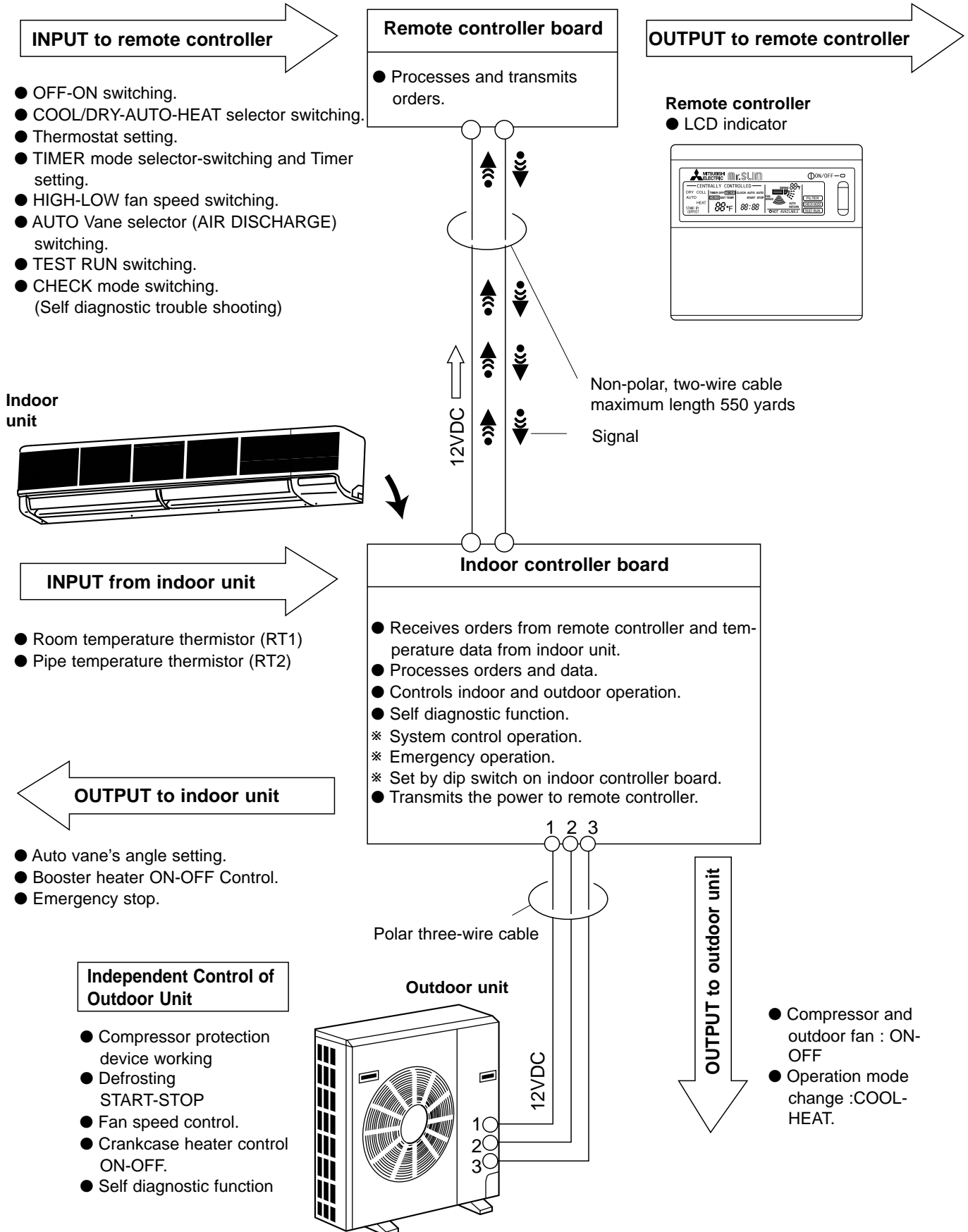
In the case of (i), (ii) and (iii) above, airflow is horizontal regardless the VANE setting.

- \*16 When AUTO operation is started, COOL or HEAT mode is selected automatically.

- \*17 T1 : Room temperature.

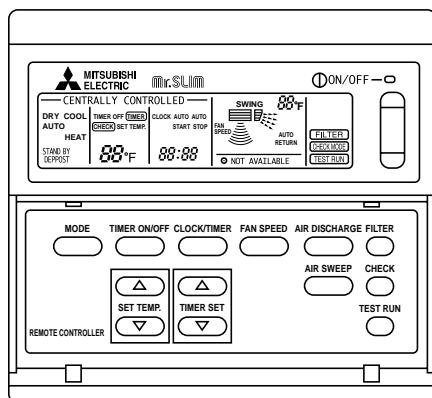
To : Set temperature.

## 1. OUTLINE OF MICROPROCESSOR CONTROL



## 2. INDOOR UNIT CONTROL

### 2-1 COOL operation

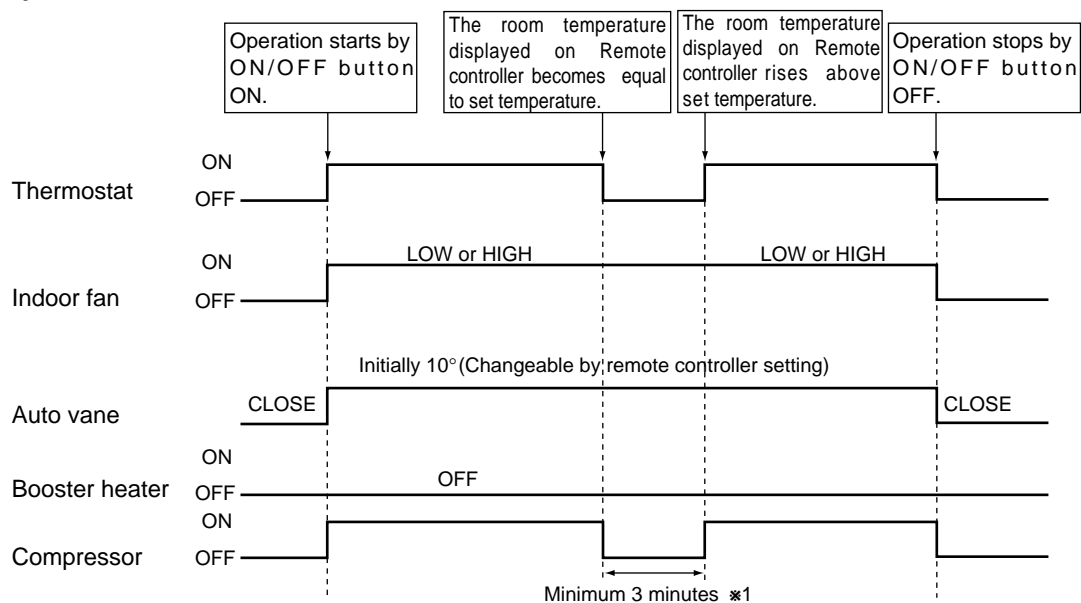


#### <How to operate>

- ① Press the ON/OFF button.
- ② Press MODE button to set operation mode to Cool.
- ③ To set desired temperature, press SET TEMP.button.

**NOTE :** Set temperature changes by 2°F in the range 65~87°F, each time SET TEMP. button is pressed.

#### <COOL operation time chart>



\*1 Even if the room temperature displayed on remote controller rises above the set temperature during this period, the compressor will not start until this period has ended.

## (1) Compressor control

### ① 3-minute time delay

To prevent overload, the compressor will not start within 3 minutes after stop.

### ② The compressor runs when room temperature is higher than set temperature.

The compressor stops when room temperature is equal to or lower than the set temperature.

The compressor maintains the previous state when the room temperature minus the set temperature is 0 degrees or more, or lower than 2 degrees.

### ③ The compressor stops in check mode or during protective functions.

### ④ Coil frost prevention

To prevent indoor coil frost, the compressor will stop when the indoor coil thermistor (RT2) reads 34°F or below after the compressor has been continuously operated for at least 16 minutes or more. When the indoor coil temperature rises to 50°F or above, the compressor will start in a 3-minute(\*2) time delay.

\*2 When the indoor coil temperature is 30°F or less, the compressor starts in 6 minutes.

**NOTE :** By turning OFF the dip switch SW1-3 on indoor controller board, the start temperature of coil frost prevention changes from 34°F to 36°F.

### ⑤ Coil frost protection

When indoor coil temperature becomes 5°F or below, coil frost protection will proceed as follows.

#### <Start condition>

After the compressor has been continuously operated for 3 minutes or more, and the indoor coil temperature has been 5°F or below for 3 minutes, the coil frost protection will start.

#### <Coil frost protection>

Compressor stops for 6 minutes, and then restarts.

If the start condition is satisfied again during the first 10 minutes of compressor operation, both the indoor and outdoor units stop, displaying a check code of "P6" on the remote controller.

#### <Termination conditions>

Coil frost protection is released when the start condition is not satisfied again during the allowance, or when the COOL mode stops or changes to another mode.

## (2) Indoor fan control

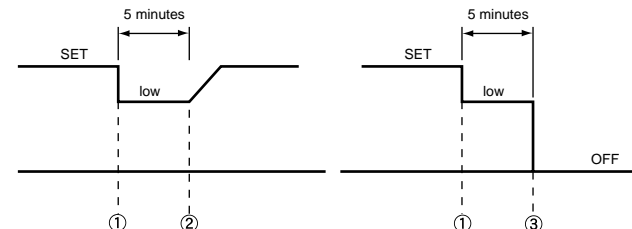
Indoor fan speed LOW/HIGH depends on the remote controller setting.

However, if an outdoor unit abnormality is detected, the indoor fan speed will be LOW, regardless of the remote controller setting.

(i) Fan speed LOW/HIGH depends on the remote controller setting regardless of the thermostat ON/OFF.

(ii) Fan speed will remain on LOW if an abnormality in outdoor unit is detected. (5 minutes)

**NOTE :** Fan stops immediately if the unit stops or the check mode is started. (a) Normal control



- ① Start-up of outdoor unit abnormality detection.
- ② Release of outdoor unit abnormality detection.
- ③ Unit stop due to outdoor unit abnormality with P8 indication.

**NOTE 1 :** Fan stops immediately if the unit stops or the check mode is started.

### (3) Auto vane control

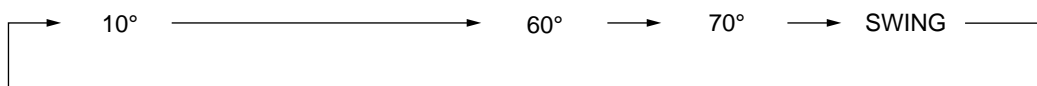
Auto vane position is set to 10 degrees airflow at the start-up of COOL operation. It can then be changed by the remote controller.

(a) Vane position set mode & swing mode.

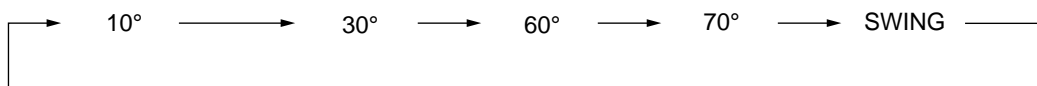
(i) Every time AIR DISCHARGE button is pressed, setting will be changed .

(ii) Airflow direction can be changed with AIR DISCHARGE button.

① Fan speed : LOW



② Fan speed : HIGH



#### <AUTO RETURN>

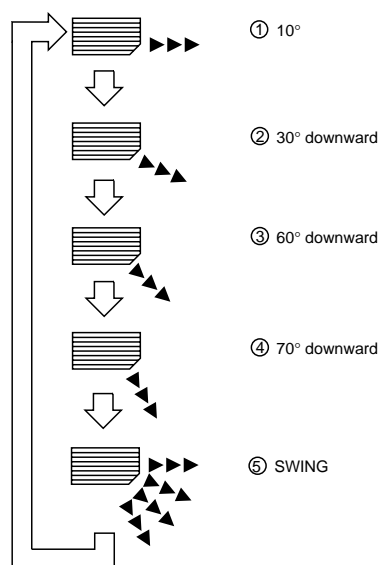
When discharge 60° or 70° continues for 1 hour with the fan speed at LOW, the discharge direction turns to the horizontal discharge automatically.

After that, 60° or 70° is available by setting with the remote controller, and it continues for 1 hour.

If the discharge direction changes from 60° or 70°, the direction returns to the horizontal discharge when 1 hour has passed since the discharge 60° started.

If the discharge direction changes from 60° (or 70°) to the horizontal discharge, the 1-hour timer to return the horizontal discharge is cancelled.

#### <Remote controller display>



Changes by pressing the AIR DISCHARGE button.

#### (4) Detecting abnormalities in the outdoor unit

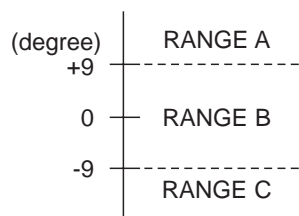
After the compressor has been continuously operated for 3 minutes, if the difference between the indoor coil temperature and room temperature is out of RANGE C for 1 minute, the indoor fan speed will turn to LOW. Five minutes later, if the difference is still out of RANGE C, the outdoor unit is functioning abnormally. Thus, the compressor stops and check code "P8" appears on remote controller.

RANGE A : Indoor coil temperature is more than 9 degrees above room temperature.

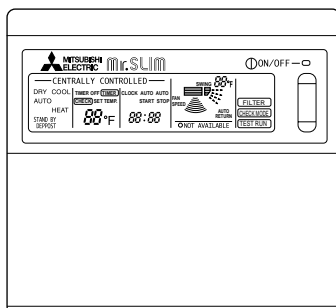
RANGE B : Indoor coil temperature is within 9 degrees either way of room temperature.

RANGE C : Indoor coil temperature is more than 9 degrees below room temperature.

Indoor coil temperature  
minus room temperature



## 2-2 DRY operation

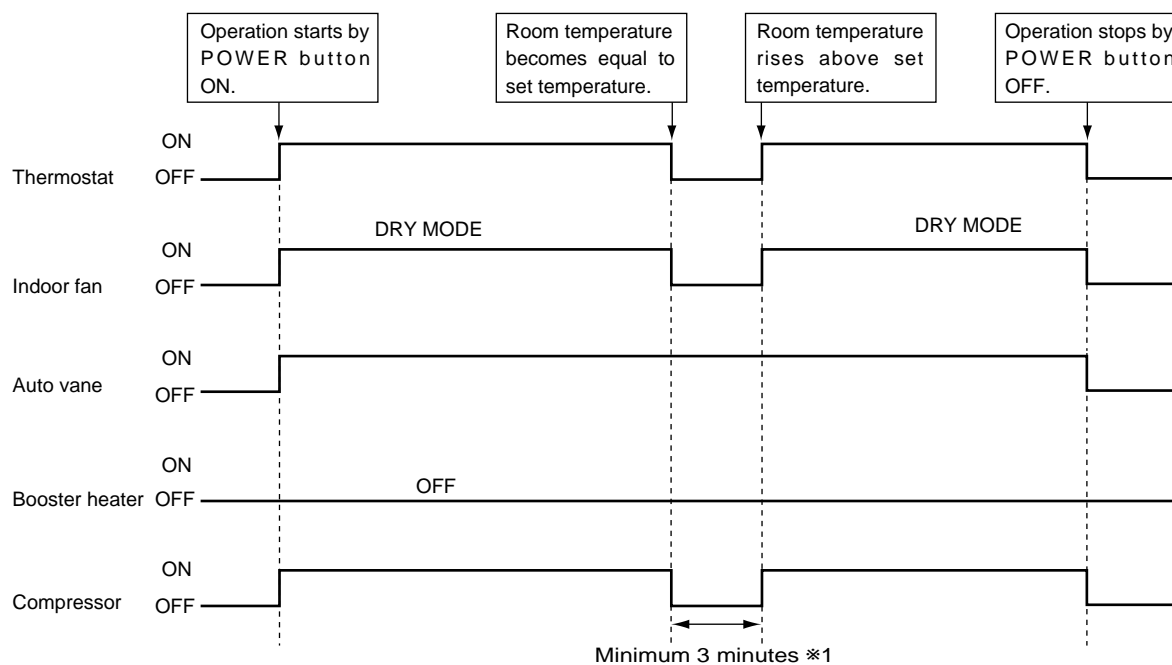


### <How to operate>

- ① Press POWER ON/OFF button.
- ② Press the MODE button to display "DRY"
- ③ Press the SET TEMP. button to set the desired temperature.

**NOTE:** The set temperature changes 2°F when the SET TEMP. button is pressed one time.  
Dry 65 to 87°F

### <DRY operation time chart>



\*1 Even if the room temperature rises above the set temperature during this period, the compressor will not start until this period has ended.



### (1) Compressor control

#### ① 3-minute time delay

To prevent overload, the compressor will not start within 3 minutes after stop.

#### ② The compressor runs when room temperature is higher than set temperature.

The compressor stops when room temperature is equal to or lower than the set temperature.

The compressor maintains the previous state when the room temperature minus the set temperature is 0°F or more, or lower than 2°F.

#### ③ The compressor stops in check mode or during protective functions.

#### ④ The compressor will not start when the room temperature is 64°F or below.

The compressor starts intermittent operation when the power is turned ON with room temperature above 64°F. The compressor ON/OFF time depends on the thermostat ON/OFF and the following room temperatures. After 3-minute compressor operation,

- If the room temperature thermistor reads above 82°F with thermostat ON, the compressor will operate for 6 more minutes and then stop for 3 minutes.

- If the room temperature thermistor reads 79°F to 82°F with thermostat ON, the compressor will operate for 4 more minutes and then stop for 3 minutes.

- If the room temperature thermistor reads 75°F to 79°F with thermostat ON, the compressor will operate for 2 more minutes and then stop for 3 minutes.

- If the room temperature thermistor reads below 75°F with thermostat ON, the compressor will stop for 3 minutes.

- If the thermostat is OFF regardless of room temperature, the compressor will stop for 10 minutes.

#### ⑤ Coil frost protection

Coil frost protection in DRY operation is the same as in COOL operation.

#### ⑥ Coil frost prevention

Coil frost prevention does not operate in DRY operation.

### (2) Indoor fan control

The indoor fan runs on LOW speed during compressor operation. The fan speed cannot be changed with the remote controller. Also, the fan runs on LOW speed when the pipe temperature is 43°F or more, or the compressor is OFF and the pipe temperature is below 43°F.

#### (a) During compressor OFF

- When the indoor coil temperature is 43°F or above, the indoor fan will stop.

- When the indoor coil temperature is below 43°F, the indoor fan will run on LOW speed.

#### (b) During compressor ON

- The indoor fan runs on LOW speed.

<Dry mode>

The fan notch is controlled by the indoor coil temperature every 30 seconds.

#### Fan control in DRY operation.

	Pipe temp.	Fan
Compressor OFF	43°F or more	STOP
	Below 43°F	LOW
Compressor ON	All	LOW

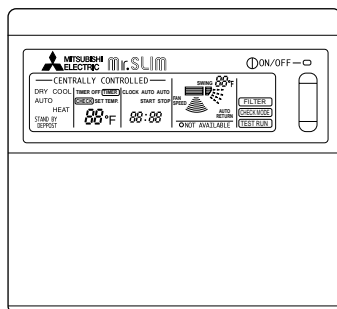
### (3) Auto vane controls

Same as in COOL operation

### (4) Detecting abnormalities in the outdoor unit

An abnormality in the outdoor unit can not be detected in DRY operation.

## 2-3 HEAT operation



### <How to operate>

- ① Press POWER ON/OFF button.
- ② Press the MODE button to display "HEAT"
- ③ Press the SET TEMP. button to set the desired temperature.

**NOTE:** The set temperature changes 2°F when the SET TEMP. button is pressed one time.  
Heating 63 to 83°F.

### <Display in HEAT operation>

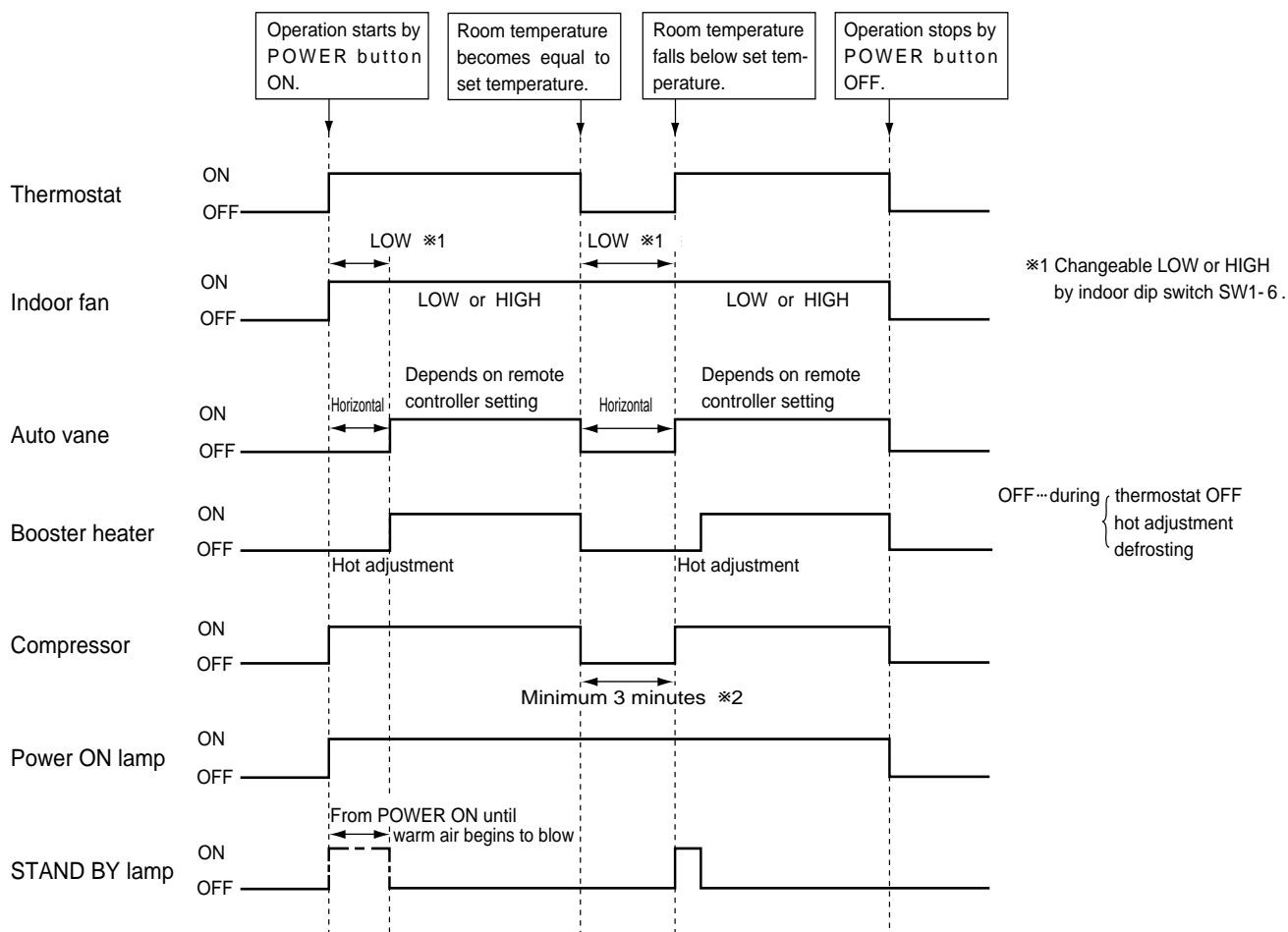
#### [DEFROST]

The [DEFROST] symbol is only displayed during the defrost operation.

#### [STANDBY]

The [STANDBY] symbol is only displayed from the time the heating operation starts until the heated air begins to blow.

### <HEAT operation time chart>



\*2 Even if the room temperature falls below the set temperature during this period, the compressor will not start until this period has ended.

## (1) Compressor control

### ① 3-minute time delay

To prevent overload, the compressor will not start within 3 minutes after stop.

### ② The compressor runs when the room temperature is lower than the set temperature.

The compressor stops when the room temperature is equal to or higher than the set temperature.

### ③ The compressor stops in check mode or during protective functions.

### ④ Overheat protection

#### <Start condition>

When the indoor coil thermistor reads 158°F or above, the overheat protection will start.

#### <Overheat protection>

The compressor stops for 6 minutes, and then restarts.

If the start condition is satisfied again within 10 minutes of compressor operation, both the indoor and outdoor units stop, displaying a check code of "P6" on the remote controller.

#### <Termination conditions>

Overheat protection is terminated when the start condition is not satisfied again during the allowance (10-minute compressor operation), when operation mode changes to other mode, or when thermostat turns OFF.

## (2) Indoor fan control

### (a) Normal control

#### (i) The indoor fan runs on LOW speed during the thermostat OFF.

LOW speed can be changed to HIGH speed by setting the dip switch SW1-6.

If the indoor coil temperature becomes more than 5 degrees below the room temperature during the thermostat OFF, the indoor fan will stop. After, when the indoor coil temperature becomes within 5 degrees of room temperature, the indoor fan will run on LOW speed.

#### (ii) Hot adjustment

Hot adjustment is a warm-up for HEAT operation

##### <Start conditions>

The hot adjustment works under any of the following conditions.

- HEAT operation starts.
- Defrosting ends.
- Thermostat turns ON.

##### [Hot adjustment]

Initially, the indoor fan runs on LOW speed. When 5 minutes have passed or the indoor coil temperature exceeds 95°F, the fan speed will not be changed. 2 minutes later, the hot adjustment ends. Then, the fan speed depends on the remote controller setting.

#### (iii) The indoor fan stops when the indoor coil temperature is within 9 degrees either way of room temperature.

#### (iv) To eliminate the remaining heat, the indoor fan runs for the first 1 minute after the booster heater is turned OFF.

### (3) Auto vane control

Auto vane position is set to 70 degrees airflow at the start-up of HEAT operation.

(a) Vane position set mode & swing mode.

( i ) Every time AIR DISCHARGE button is pressed, setting will be changed .

( ii ) Airflow direction can be changed with AIR DISCHARGE button.



NOTE : In the following cases, the discharge direction is 10° regardless of the remote controller setting.

- ① During the hot adjustment with fan speed at LOW
- ② During defrosting with indoor fan OFF
- ③ During thermostat OFF

### (4) Booster heater control

When the room temperature is 6 degrees below the set temperature, the booster heater will turn ON.

When the room temperature is equal to the set temperature, booster heater will turn OFF.

During the hot adjustment, the booster heater will not work.

#### <Overheat prevention>

When the indoor coil thermistor rises to 140°F or above, the booster heater cannot work.

When the indoor coil thermistor falls to 131°F or below, the booster heater can work.

### (5) Detecting abnormalities in the outdoor unit

When the outdoor unit is determined to be abnormal by the following causes, the compressor will stop and the check code " P8 " will appear on the remote controller display.

( i ) During compressor ON while hot adjustment is set.

① If the difference between the indoor coil temperature and room temperature is in the RANGE B, the indoor fan will stop.

② Within 20 minutes after entering RANGE B (except for the first 10 seconds),

a) If the temperature difference enters RANGE A, the hot adjustment starts,

b) If the temperature difference is still in RANGE B, the outdoor unit is deemed abnormal.

c) If the temperature difference enters RANGE C, defrosting starts.

③ Within 20 minutes after entering RANGE C, if the temperature difference does not return to RANGE B, the outdoor unit is deemed abnormal.

④ If the temperature difference returns to RANGE B, the next 20 minutes is an allowance period. If the difference enters RANGE A during the allowance, defrosting ends and the hot adjustment starts. If the difference does not enter RANGE A during the allowance, the outdoor unit is deemed abnormal.

( ii ) During compressor ON in defrosting

After 30 minutes of defrosting in hot adjustment, if the temperature difference is still in RANGE C, the outdoor unit is determined to be abnormal.

When RANGE B does not change to RANGE A after 20 minutes have passed since RANGE C had outdoor unit is determined to be abnormal.

( iii ) During compressor OFF

Not detecting abnormalities.

## (6) Indoor coil temperature abnormality detection

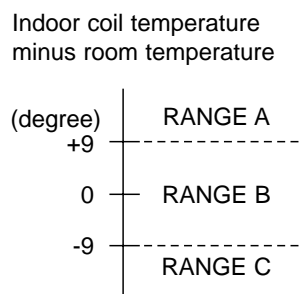
An abnormality can be detected during compressor ON, except for the following.

- For the first 30 minutes after the temperature difference between the indoor coil temperature and room temperature enters the RANGE C.
- When the temperature difference enters the RANGE C until it moves to the RANGE B.

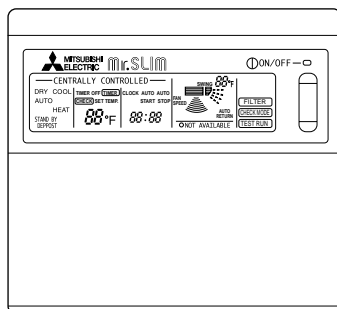
## (7) Defrosting operation

After the outdoor unit starts the defrosting operation, when the temperature difference between the indoor coil temperature and room temperature gets out of RANGE A and into RANGE B, the indoor unit starts the defrosting mode. After the outdoor unit stops the defrosting operation, when the temperature difference returns to the RANGE A, the indoor unit stops the defrosting mode. While the indoor unit is in the defrosting mode, the indoor fan and the booster heater stop.

- \*1 RANGE A : Indoor coil temperature is more than 9 degrees above room temperature.  
RANGE B : Indoor coil temperature is within 9 degrees either way of room temperature.  
RANGE C : Indoor coil temperature is more than 9 degrees below room temperature



## 2-4 AUTO operation (Automatic COOL/HEAT change over operation)



### <How to operate>

- ① Press POWER ON/OFF button.
- ② Press the MODE button to display "AUTO"
- ③ Press the SET TEMP. button to set the desired temperature.

**NOTE:** The set temperature changes 2°F when the SET TEMP. button is pressed one time.  
Automatic 65 to 83°F.

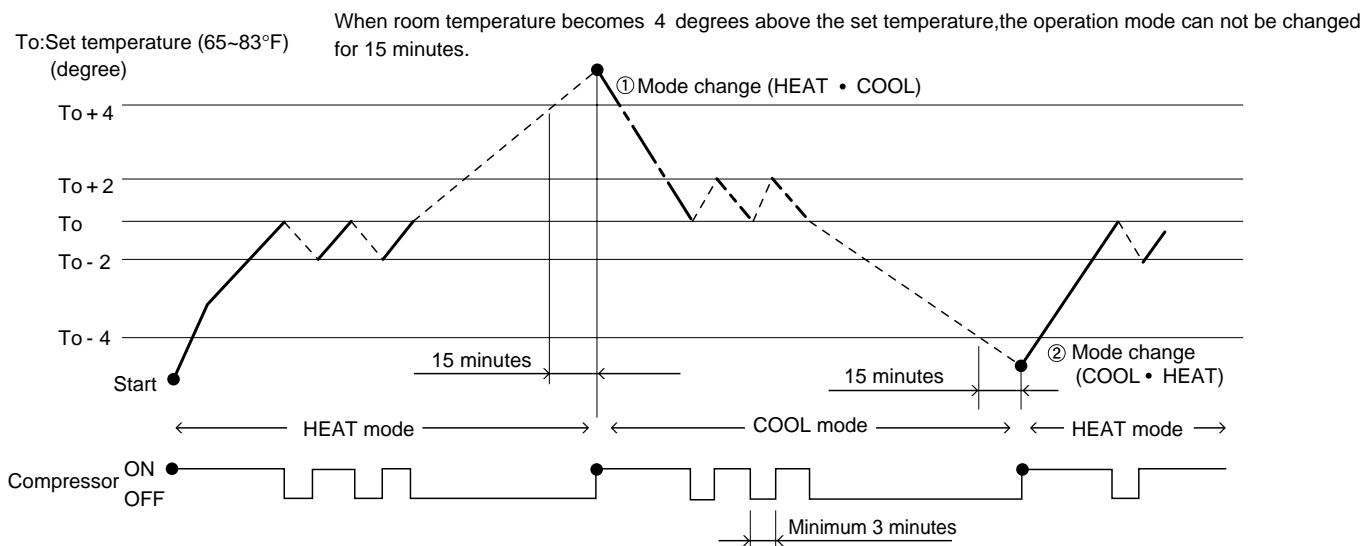
● "AUTOMATIC" works to change by itself the operation mode either to cooling or heating according to the room temperature.

### (1) Initial mode

- ① When AUTO operation starts after unit OFF.
  - If the room temperature is higher than the set temperature, operation starts in COOL mode.
  - If the room temperature is equal to or lower than the set temperature, operation starts HEAT mode.
- ② When AUTO operation starts after COOL or HEAT operation, the previous mode continues.

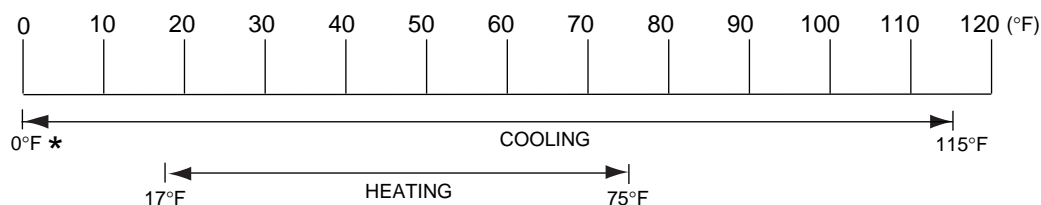
### (2) Mode change

- ① HEAT mode changes to COOL mode when 15 minutes have passed since the room temperature became 4 degrees above the set temperature.
- ② COOL mode changes to HEAT mode when 15 minutes have passed since the room temperature became 4 degrees below the set temperature.



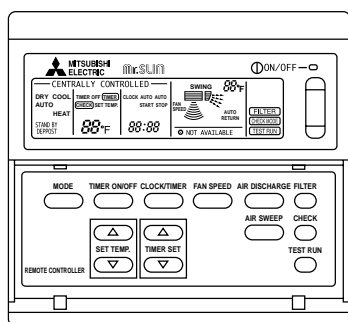
### (3) Temperature range

AUTO operation is available under the outside air temperatures as follows.



\* In case of the wind baffle installed.

## 2-5 Auto vane control

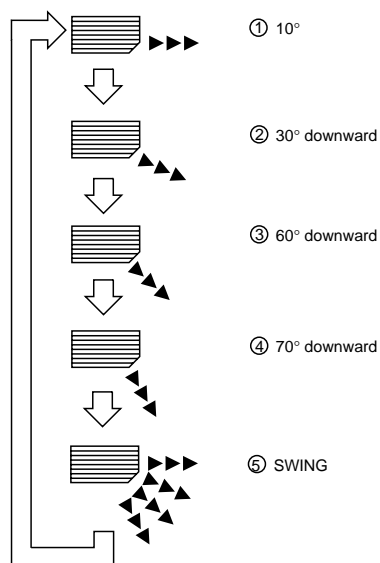


### <How to operate>

To change the air flow direction, press AIR DISCHARGE button.

①	②	③	④	⑤
10°	30°	60°	70°	SWING

### <Remote controller display>



Available in COOL operation with fan speed on HIGH or in HEAT operation.  
Unavailable in DRY operation.  
If fan speed changes from LOW to HIGH during 30° downward discharge in COOL mode, the direction automatically changes to 10°.

Changes by pressing the AIR DISCHARGE button.

### (1) COOL/DRY operation

At the start-up of COOL or DRY operation, the discharge direction is automatically set to 10°. After, it can be changed to another direction with AIR DISCHARGE button on the remote controller.

#### <Auto return>

When 60° or 70° discharge is set with fan speed on LOW, "AUTO RETURN" appears below the room temperature display. One hour later the direction changes to 10° automatically and "AUTO RETURN" disappears.

### (2) HEAT operation

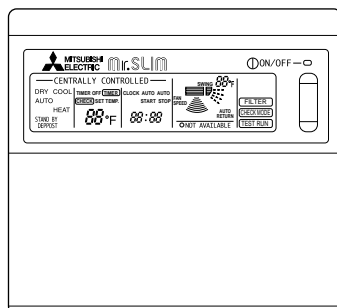
At the start-up of HEAT operation, discharge direction depends on the setting of the last operation.

After, it can be changed to another direction with AIR DISCHARGE button. The discharge direction shifts to 10° regardless of the remote controller settings under any of the following conditions.

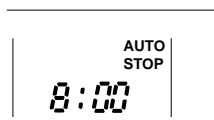
- Thermostat OFF
- Defrosting
- Indoor fan speed LOW in hot adjustment

## 2-6 TIMER operation

### WIRED REMOTE CONTROLLER



#### <Timer setting example>



#### <Timer function>

AUTO STOP .....The air conditioner stops after the set time lapses.

AUTO START .....The air conditioner starts after the set time lapses.

AUTO OFF .....Timer is not active.

#### <How to operate>

1. Press POWER ON/OFF button.
2. Press "TIMER ON/OFF" button to select AUTO STOP or AUTO START.
3. Press "CLOCK/TIMER" button to set desired time.  
Time setting is in 1 hour units for up to 24 hours.  
Each time TIMER SET button is pressed, set time increases by 1 hour. When TIMER SET button is pressed and held, the set time increases by 1 hour every 0.5 seconds.
4. To cancel the timer operation, press POWER ON/OFF button.

This setting will stop the operation in 8hours.

With the lapse of time, time display changes in 1hour units, showing remaining time.

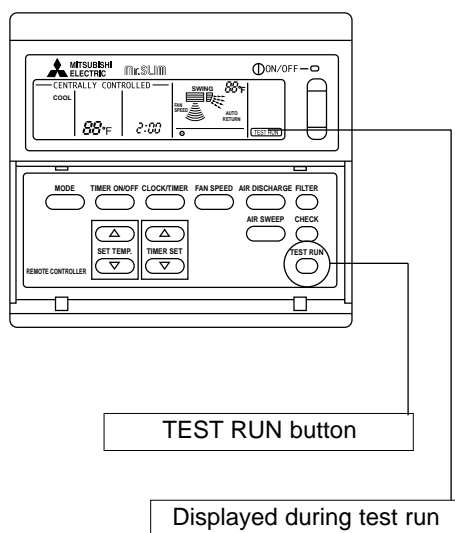
## 2-7 Test run

### <Before test run>

- After installing, wiring, and piping the indoor and outdoor units, check for refrigerant leakage, looseness in power supply or control wiring, and mistaken polarity.
- Use a 500-volt measure to check the resistance between the power supply terminal block and ground to make sure that it is at least 1.0MΩ.

#### Attention:

**Do not use the air conditioner if resistance is less than 1.0MΩ.**



#### <How to operate>

1. Turn ON main breaker.
2. Press TEST RUN button twice. "TEST RUN" is displayed on remote controller.
3. Select "COOL" with MODE button to check that cool air is beginning discharged.  
Select "HEAT" with MODE button to check that warm air is beginning discharged.(after a while)
4. Select LOW/HIGH with FAN SPEED button to check that the fan speed changes properly.
5. Press AIR DISCHARGE button to check auto vane operation.
6. Check outdoor fan operation.
7. Check compressor operation referring to the indoor coil temperature code displayed on the remote controller.
8. After checking, press the ON/OFF button.

·The test run works for 2 hours and stops automatically.

To cancel the test run, press ON / OFF button or TIMER ON / OFF button.



(1) Indoor coil temperature code

During the test run, the indoor coil temperature code from 1 to 15 is displayed on the remote controller instead of room temperature. The code should fall with the lapse of time in normal COOL operation, and should rise in normal HEAT operation.

Code	1	2	3	4	5	6	7	8
Indoor coil temperature	~34(36)°F	36(37)°F~50°F	~59°F	~68°F	~77°F	~86°F	~95°F	~104°F
Code	9	10	11	12	13	14	15	
Indoor coil temperature	~113°F	~122°F	~131°F	~140°F	~158°F	~191°F	Thermistor abnormality	

(2) Trouble during test run

- If the unit malfunctions during the test run, refer to section 11 in this manual entitled "TROUBLESHOOTING."
- When the optional program timer is connected to the conditioner, refer to its operating instructions.

## 2-8 Emergency operation

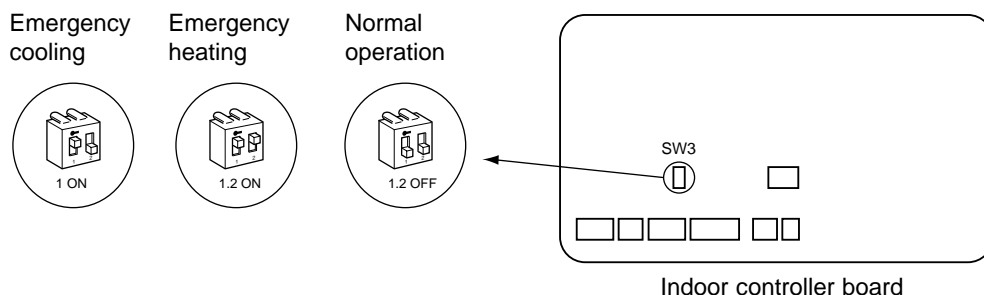
When the remote controller or microprocessor malfunctions but all other parts are normal, emergency operation is started by setting the dip switch SW3 on the indoor controller board.

### <Before emergency operation>

1. Make sure the compressor and the indoor fan are operating normally.
2. Locate the defect with the self-diagnostic function. When the self-diagnostic function indicates "protective function is working", release the protective function before starting the emergency operation.  
CAUTION: When the self-diagnostic function indicates a check code of "P5" (drain pump malfunction), do not start the emergency operation because the drain may overflow.

### <How to operate>

1. For emergency cooling, set the dip switch SW3-1 to ON and SW3-2 to OFF.  
For emergency heating, set the dip switch SW3-1,2 to ON.



2. Turn ON the outdoor unit breaker and then ON the indoor unit breaker.  
Emergency operation will now start.
3. During emergency operation, the indoor fan operates on high speed, the auto vanes do not operate.
4. To stop emergency operation, turn OFF the indoor unit breaker.
5. Movements of the vanes do not work in emergency operation, therefore you have to slowly set them manually to the appropriate position.

NOTE: The remote controller POWER ON/OFF button can not start/stop emergency operations.

CAUTION: Do not use emergency cooling for more than 10 hours, as the indoor coil may freeze.

## 2-9 Dip switch functions

Each figure shows the initial factory setting.

### (1). On remote controller board

#### 1. SW17(Address selector)

	1	2	3	4	5	6	7	8
ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

SW17-1~6) For address setting

SW17-7) When two remote controllers are used, this switch sets the controller function.

OFF: The remote controller is set as a main controller.

ON: The remote controller is set as a sub controller.

SW17-8) Switch for system back-up.

OFF: Without back-up

ON: With back-up

#### 2. SW18(Function selector)

	1	2	3	4	5	6	7	8
ON	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
OFF	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

SW18-1) Switch for timer

OFF: Single day ON: timer every day

SW18-2) Switch for filter sign

OFF: filter sign absent

ON: filter sign present

SW18-3) Switch for filter sign time setting.

OFF: 100Hr ON: 2500Hr

SW18-4~8) Not for use.

### (2). On indoor controller board

#### 1. SW1 (Mode selector)

	1	2	3	4	5	6	7	8	9	10
ON	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
OFF	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

SW1-1) Switch that changes between FAN mode and AUTO mode

OFF: AUTO mode for models with heat pump

ON: Fan mode for models without heat pump

SW1-2) Switch for drain pump

OFF: The drain pump works in COOL and DRY operation.

ON: The drain pump works in both COOL and DRY and HEAT operation.

SW1-3) Switch to change the temperature to start coil frost prevention

OFF: 34°F

ON: 36°F

SW1-4) Switch for set temperature adjustment in HEAT mode

During HEAT operation, warm air collects near the ceiling. When the indoor unit is installed near the ceiling, the temperature read by room temperature thermistor differs from the actual living-space temperature by about 7 degrees. Therefore, the room temperature read by room temperature thermistor must be lowered by 7 degrees.

OFF: 7-degree adjustment

ON: NO adjustment

SW1-5) Not for use.

SW1-6) Switch for fan speed during thermostat OFF in HEAT operation

OFF: LOW

ON: LOW or HIGH (set with remote controller)

SW1-7) Switch for detecting abnormalities in the outdoor unit abnormality detection

OFF: When an abnormality occurs, it is detected.

ON: Even if an abnormality occurs, it can not be detected.

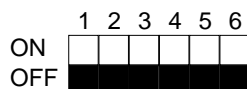
SW1-8) Switch for auto restart function

OFF: This function does not work

ON: This function works.

SW1-9, 10) Not for use.

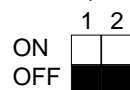
## 2. SW2 (Address selector)



Used in setting the unit-address for group control.  
For further information, refer to page OC273-51.

## 3. SW3 (Emergency operation switch)

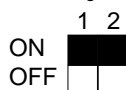
Normal operation



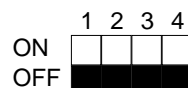
For emergency cooling



For emergency heating



## 4. SW5 (Model selector)



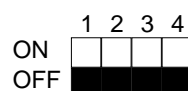
SW5-1) Not for use.

SW5-2) Leave this switch as it is.

SW5-3) Not for use.

SW5-4) Not for use.

## 5. SW6 (Address selector)




This switch is not available for series PKH.

## 6. SW7 (Model selector)

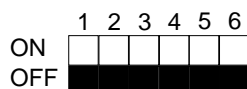
Switch to set the output of phase-controlled indoor fan motor.

Address setting is available at any time.

The initial factory setting by is based on each capacity.

Service Ref.	PKH18FK3	PKH24FK3	PKH30FK3	PKH36FK3
SW7	ON 	ON 	ON 	ON 
	OFF 	OFF 	OFF 	OFF 
	1 2 3	1 2 3	1 2 3	1 2 3

## 7. SW8 (Option)



SW8-1~2) Not for use.

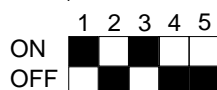
SW8-3~4) Not for use.

SW8-5) Not for use.

SW8-6) OFF: For 230V power supply

ON: For 208V power supply

## 8. SW9 (Model selector)



SW9-1~5) Keep this switch.

## 2-10 INDOOR FAN CONTROL

Indoor fan relay output.

(a) During fan ON

The indoor fan relay turns ON. One second later, the phase control will start.

(b) During fan OFF

The phase control turns OFF. One second later, the indoor fan relay will turn OFF.

## 1. TROUBLES IN TEST RUN

Symptom	Cause	Check points																				
The display “CENTRALLY CONTROLLED” on remote controller does not disappear.	1) Wrong address setting of remote controller/indoor controller board. 2) Timer adapter is connected to the remote controller. 3) Signal transmission error between indoor unit and remote controller.	1) Check the address setting of remote controller and indoor controller. 2) Make sure the timer adapter is used correctly. 3) ① Turn another remote controller's DIP SW17-7 ON to make it sub controller. ② Connect the sub controller to the unit, and turn circuit breaker ON. ● If the display “centrally controlled” disappears, replace the original remote controller. ● If the display remains the same, replace the indoor controller board.																				
When remote controller POWER button is turned ON, the check code “E0”appears.	1) Signal transmission error between indoor unit and remote controller	1) ① Connect a sub remote controller. ② Turn circuit breaker ON. If the display “centrally controlled” remains, replace the indoor controller board. ③ If the display disappears, turn the remote controller POWER button ON and check as follows. <table><tr><td></td><td>Remote controller</td><td>Sub remote controller</td><td>Malfunction</td></tr><tr><td>1</td><td>Operating Display</td><td>E0 Display</td><td>Malfunction of indoor Unit</td></tr><tr><td>2</td><td>Operating Display</td><td>Operating Display</td><td>Malfunction of Remote controller</td></tr><tr><td>3</td><td>No Display</td><td>E0 Display</td><td>Malfunction of indoor Unit and Remote Controller</td></tr><tr><td>4</td><td>No Display</td><td>Operating Display</td><td>Malfunction of Remote controller</td></tr></table>		Remote controller	Sub remote controller	Malfunction	1	Operating Display	E0 Display	Malfunction of indoor Unit	2	Operating Display	Operating Display	Malfunction of Remote controller	3	No Display	E0 Display	Malfunction of indoor Unit and Remote Controller	4	No Display	Operating Display	Malfunction of Remote controller
	Remote controller	Sub remote controller	Malfunction																			
1	Operating Display	E0 Display	Malfunction of indoor Unit																			
2	Operating Display	Operating Display	Malfunction of Remote controller																			
3	No Display	E0 Display	Malfunction of indoor Unit and Remote Controller																			
4	No Display	Operating Display	Malfunction of Remote controller																			
When remote controller POWER button is turned ON, operating display appears, but disappears soon.	1) Short circuit of indoor/outdoor connecting wire 2) Short circuit of transmission wire. 3) Wrong operation of remote controller due to noise wave emitted by other appliances.	1), 2) Check the wire 3) Turn the circuit breaker OFF, and then turn ON. If the remote controller remains abnormal, despite the above measures, replace the indoor controller board.																				
Despite turning POWER button ON, the remote controller display does not appear.	1) Damaged remote controller. 2) Short circuit of transmission wire. 3) Bad contact of indoor CN40. 4) CN40 is attached to a sub unit. 5) Damaged power board. 6) Bad contact of CN2D. 7) Blown fuse. 8) Circuit breaker OFF.	1) Measure the voltage between terminals of remote controller. If no voltage, remove the terminals and measure the voltage between wires. If the voltage is between 6VDC and 12V, replace the remote controller. 2) ~ 8) Check each point. If it is not defective, replace the indoor controller board.																				

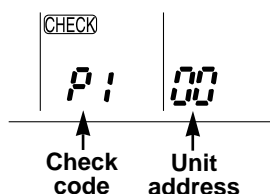
## 2. SELF DIAGNOSTIC FUNCTION WITH REMOTE CONTROLLER (WIRED REMOTE CONTROLLER)

### 2-1 When malfunction occurs during operation

When a malfunction occurs, the indoor and outdoor units stop and the malfunction is displayed on the LCD of the remote controller.

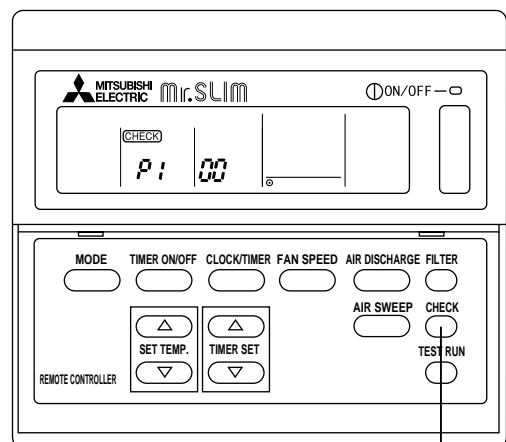
- (1) ON the set temperature display part, "CHECK" appears, and the unit address and the check code are displayed alternately at one-second intervals. (Check mode)

#### Example



- (2) When one remote controller controls several units in the group control, the LCD shows the unit address and check code of the first malfunctioning unit.
- (3) To cancel the check mode, press the ①ON/OFF button. In remote ON/OFF control, press the remote ① ON/OFF switch. In centralise control, turn OFF the ①ON/OFF button of centralise controller.

#### CHECK mode



Check button

**NOTE:** The latest check code is memorise, even if the check mode is cancelled by the way mentioned above. It takes 60 seconds maximum to display the memorise check code.

### 2-2 How to use the self diagnostic function for service

#### A. For normal control with one unit and one remote controller

- (1) Pressing the CHECK button on the remote controller twice starts the self diagnostic function.
- (2) During the self diagnostic function, "CHECK MODE" appears at two positions on the remote controller display. Then, at least 10 seconds later, the unit address and the check code is alternately displayed at one-second intervals.
- (3) Check and repair the unit according to the check code. (Refer to the next page.)

#### B. For group control using one remote controller

- (1) Pressing the CHECK button on the remote controller twice starts the self diagnostic function.
- (2) Press the SET TEMP. button or SET TEMP. button on the remote controller to advance or go back to the unit address. Each time SET TEMP. button is pressed, the unit address advances by one. Each time SET TEMP. button is pressed, the unit address goes back by one.  
The check code and the unit address, appear alternately.
- (3) The check code "U8" means no malfunction has occurred since installation.  
The check code "E0" means the following conditions:
  - The unit address displayed on the remote controller does not apply to any unit.
  - power is not supplied to the unit.
  - Signal transmitting/receiving circuit is abnormal.
- (4) Check and repair the unit according to the check code. (Refer to the next page.)

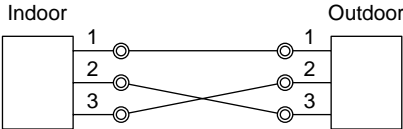
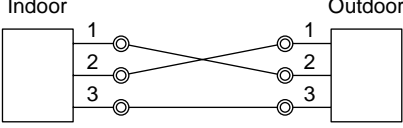
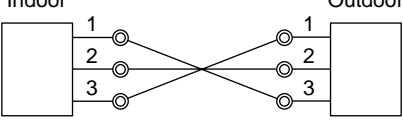
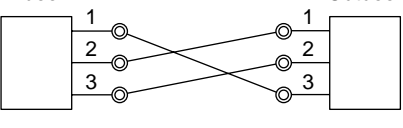
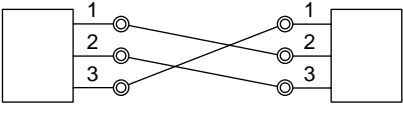
Check code	Diagnosis of malfunction	Cause	Check points
E0	Signal transmitting/receiving error (Indoor controller does not respond to remote controller signal.)	During individual unit control 1) Bad contact of transmission wire 2) Signal transmitting/receiving circuit is abnormal.	1) Check the transmission wire. 2) Check with another remote controller. If "E0" is still indicated, replace the indoor controller board. If other check code appears. replace the original remote controller.
P1	Abnormality of room temperature thermistor (RT1)	1) Bad contact of thermistor 2) Damaged thermistor	1) Check the thermistor. 2) Measure the resistance of the thermistor. Normal resistance should be as follows. 32°F.....15kΩ    86°F.....4.3kΩ 50°F.....9.6kΩ    104°F...3.0kΩ 68°F.....6.3kΩ If the resistance is normal, replace the indoor controller board.
P2	Abnormality of indoor coil thermistor (RT2)		
P3	Signal transmission error (Remote controller does not respond to indoor controller signal.)	1) Bad contact of transmission wire 2) Signal transmitting/receiving circuit is abnormal. 3) Wrong operation due to noise wave emitted by other appliances	1) Check the transmission wire. 2) Check with another remote controller. If "P3" is still indicated, replace the indoor board. If other check code appears, replace the original remote controller. 3) Short-circuit between ① and ② of CN40 and attach CN40 to the following units. ● Second unit in twin control ● Second and third units in triple control ● Sub units in group control
P4	Abnormality of drain sensor	1) Bad contact of transmission wire 2) Damaged thermistor	1) Check the connector. 2) Measure the resistance of the thermistor ① - ③. 32°F...6kΩ    59°F...3.2kΩ    86°F...1.8kΩ 41°F...4.8kΩ    68°F...2.6kΩ    95°F...1.5kΩ 50°F...3.9kΩ    77°F...2.2kΩ    104°F 1.3kΩ If the resistance is normal, replace the indoor controller board.
P5	Malfunction of drain pump	1) Malfunction of drain pump 2) Damaged drain sensor	1) Check the drain pump. 2) Check the drain sensor. (Check the drop of water is on.) If the resistance is normal, replace the indoor controller board.
P6	Freezing protection/overheating protection is working.	1) Short cycle of air cycle 2) Dirty air filter 3) Damaged fan 4) Abnormal refrigerant	1) Clear obstructions from the air cycle. 2) Clean the air filter 3) Check the fan. 4) Check the refrigerant temperature.
P7	System error	1) Wrong address-setting 2) Signal transmitting/receiving circuit of remote controller is abnormal. 3) Wrong SW6-setting	1) Check the address-setting. 2) Check with another remote controller. If check code other than "P7" appears, replace the original remote controller. 3) Check SW6 setting.
P8	Abnormality in outdoor unit	1) Wrong wiring of indoor/outdoor connecting wire 2) Reversed phase 3) Protection device is working 4) Damaged outdoor coil thermistor	1) Check the indoor/outdoor connecting wire. 2) Change the connection of electric wiring. 3) Check the protection device. 4) Measure the resistance of the outdoor coil thermistor. If the resistance is normal, replace the outdoor controller board.

### 3. WRONG WIRING ON SITE

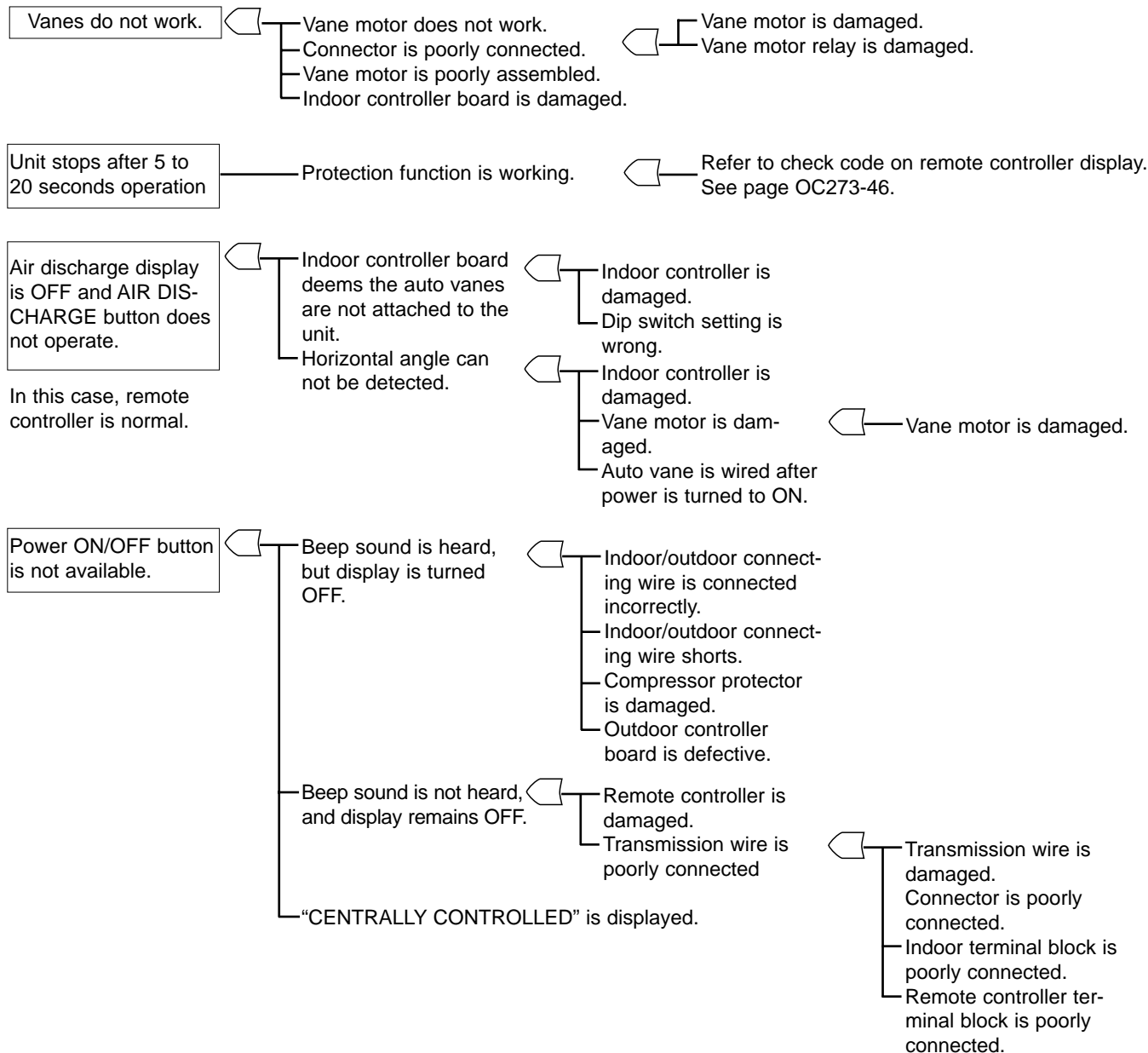
#### 3-1 Between remote controller and indoor unit

If the wire is disconnected between the remote controller and the indoor unit, nothing is displayed on the remote controller when the POWER button is pressed. The beep sound will also not be heard.

#### 3-2 Phenomenon due to wrong wiring between indoor and outdoor units

Wrong wiring	Mode	Thermostat	Phenomenon
	COOL	OFF	Operation stops.
		ON	4-Way valve turns ON. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Cooling operation. Several minutes later, check code "P8" appears on remote controller display.
		ON	Normal operation until first thermostat OFF.
	COOL	OFF	Outdoor unit stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops.
		ON	Operation stops. 27 minutes later, check code "P8" appears on remote controller display.
	COOL	OFF	Outdoor unit stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops.
		ON	Operation stops. 27 minutes later, check code "P8" appears on remote controller display.
	COOL	OFF	Outdoor unit stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops.
		ON	Operation stops, 27 minutes later, check code "P8" appears on remote controller display.
	COOL	OFF	Outdoor unit stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops.
		ON	Operation stops. 27 minutes later, check code "P8" appears on remote controller display.
Disconnection between 1 and 1 or 2 and 2.	COOL	OFF	Operation stops.
		ON	Operation stops. 9 minutes later, check code "P8" appears on remote controller display.
	HEAT	OFF	Operation stops. 4-way valve turns OFF.
		ON	27 minutes later, check code "P8" appears on remote controller display.
Disconnection between 3 and 3.	COOL	—	Normal operation.
	HEAT	OFF	Operation stops. 4-way valve turns OFF.
		ON	Operation stops. 27 minutes later, check code "P8" appears on remote controller display.

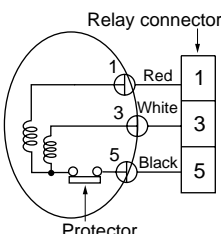
## 4. OTHER TROUBLES AND CAUSES



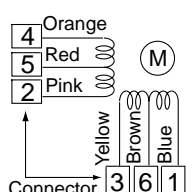


## 5. HOW TO CHECK THE PARTS

Parts name	Check points							
Room temperature thermistor (RT1) Pipe temperature thermistor (RT2)	Disconnect the connector, then measure the resistance using a tester. (Surrounding temperature 50°F to 86°F)							
	<table><tr><td>Normal</td><td>Abnormal</td></tr><tr><td>4.3kΩ to 9.6kΩ</td><td>Open or short</td></tr></table>		Normal	Abnormal	4.3kΩ to 9.6kΩ	Open or short	(Refer to the thermistor)	
Normal	Abnormal							
4.3kΩ to 9.6kΩ	Open or short							

Fan motor (MF)	Measure the resistance between the terminals using a tester. (Surrounding temperature 68°F)			
	Motor terminal or Relay connector	Normal		Abnormal
		PKH		
		18,24FK3	30,36FK3	Open or short
	Red-Black	107.4Ω±10%	69.7Ω±10%	
	White-Black	97.7Ω±10%	95.5Ω±10%	

Opening and closing temperature of protector. Open: 266±41°F (Fan motor OFF) Close: 176±68°F (Fan motor ON)			
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Vane motor (MV)	Measure the resistance between the terminals using a tester. (Surrounding temperature 68°F to 86°F)			
		Normal	Abnormal	
	Brown-Yellow	186 to 214Ω	Open or short	
	Brown-Blue			
	Red-Orange			
	Red-Pink			

### <Thermistor Characteristic graph>

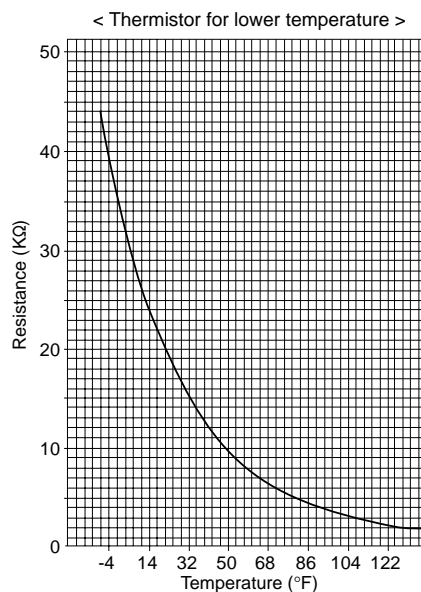
Thermistor for lower temperature

Room temperature thermistor(RT1)  
Pipe temperature thermistor(RT2)

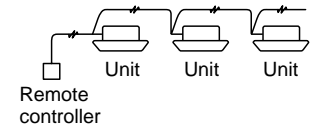
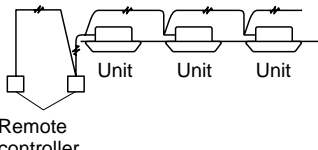
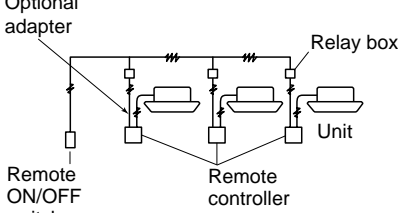
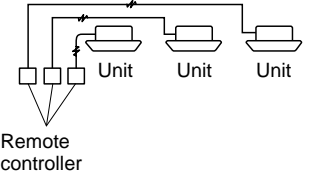
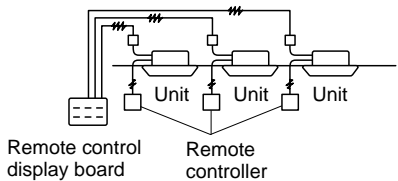
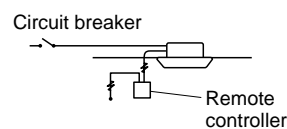
Thermistor  $R_0=15k\Omega \pm 3\%$   
Fixed number of  $B=3480k\Omega \pm 2\%$

$$R_t = 15 \exp \left\{ 3480 \left( \frac{1}{273+t} - \frac{1}{273} \right) \right\}$$

32°F	15kΩ
50°F	9.6kΩ
68°F	6.3kΩ
77°F	5.4kΩ
86°F	4.3kΩ
104°F	3.0kΩ



## 1. VARIETY OF SYSTEM CONTROL FUNCTIONS

<p>① Group control with a single remote controller (See page OC273-51.)</p>	 <p>Remote controller</p>	<p>Many units, installed at different locations, can be started and controlled with a single remote controller. The remote controller can be mounted in a different location using a non-polar two-wire cable, which can be extended up to 500m. A maximum of 50 units can be controlled with a single remote controller. All units operate in the same mode.</p>
<p>② Control using two remote controllers (See page OC273-52.)</p>	 <p>Remote controller</p>	<p>Two remote controllers can be used to control either one unit or a group of units. Units can then be controlled from a distance or at close range. Units operate according to the latest command from either remote controller.</p>
<p>③ Both remote ON/OFF and individual controls (See page OC273-52.) ※ Timer adapter (PAC-SA89TA-E) is needed.</p>	 <p>Optional adapter Remote ON/OFF switch Relay box Remote controller</p>	<p>All units can be turned on or off simultaneously using a remote ON-OFF switch. Also, each unit can be controlled individually by each remote controller. During remote ON-OFF control, a message of "CENTRALLY CONTROLLED" is displayed on the LCD of the remote controller. This is available for both one unit control and several units control.</p>
<p>④ Individual control by grouping remote controllers (See page OC273-53.)</p>	 <p>Remote controller</p>	<p>By grouping the remote controllers in one place, several units installed at different locations can be controlled individually, and operation conditions of all units are visible without a special control board. The control method is the same as that of the single unit with a single remote controller.</p>
<p>⑤ Multiple remote control display (See page OC273-54.) ※ Multiple display adapter (PAC-SA88HA-E) is needed.</p>	 <p>Remote control display board Remote controller</p>	<p>Several units can be controlled with a remote control display board. Operation conditions of all the units are visible with the remote control display board. Individual control by each remote controller is also possible.</p>
<p>⑥ Auto restart function (See page OC273-54.)</p>	 <p>Circuit breaker Remote controller</p>	<p>A unit can be started or stopped with the circuit breaker on or off. Remote controller is also available. With this function, when the power is restored after power failure, the unit will restart automatically. (However, when the remote controller POWER ON/OFF button is OFF, the unit will not start.)</p>

## 2. GROUP CONTROL WITH A SINGLE REMOTE CONTROLLER

A maximum of 50 units can be started in order according to the dip switch settings

### 2-1 How to wire

- (1) Connect the remote controller to the double terminal block on the indoor controller board of the master unit (No.0 unit). (See Figure 1.)
- (2) Connect the double terminal block of the master unit to the double terminal block of No.1 unit.
- (3) Connect the double terminal block of No.1 unit to the double terminal block of No.2 unit.
- (4) Continue the process until all the units are connected with two-wire cables. (See Figure 2.)
- (5) Remove the connector CN40 from the indoor controller board of each unit except the master unit. (See Figure 3.)
- (6) Set the unit-address of each unit with SW2 on the indoor controller board following the instructions below.

### 2-2 How to set unit-address

The unit-address also serves as a successive-start timer which starts each unit at intervals of 1 second. If two or more units have the same unit-address in a group control, operation stops due to system error. Be sure to set SW2 correctly following the instructions below.

- (1) Each lever of SW2 shows the number as follows.
 

SW2-1 : 1	SW2-4 : 8
SW2-2 : 2	SW2-5 : 16
SW2-3 : 4	SW2-6 : 32
- (2) Total number of levers turned to ON shows the address of the unit.  
For example, to set No.3 unit, turn ON SW2-1 and SW2-2.
- (3) In this way, set from the master unit to the last unit.  
Do not forget to set the master (No. 0) unit.

Figure 1

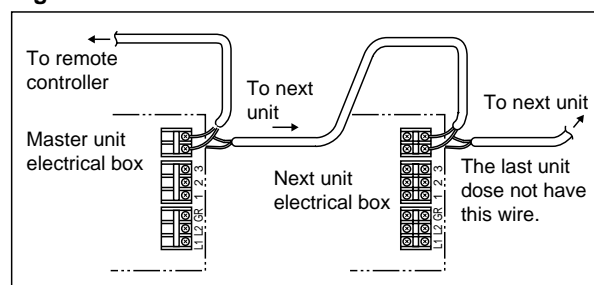


Figure 2

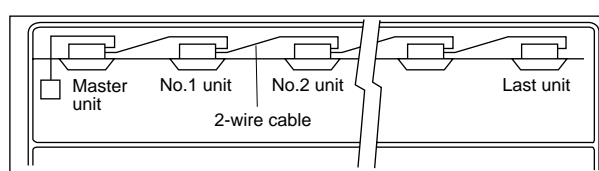
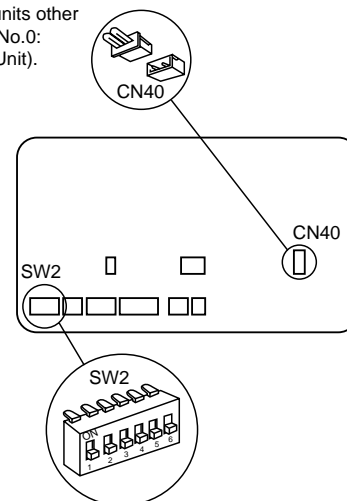


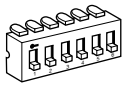
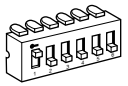
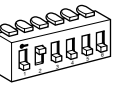
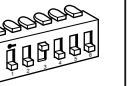
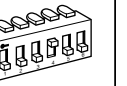
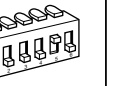
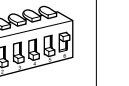
Figure 3

Indoor controller board ▼

Should be removed from all units other than unit No. 0: (Master Unit).



Setting examples

	Master (No. 0) unit	No. 1 unit	No. 2 unit	No. 4 unit	No. 8 unit	No. 16 unit	No. 32 unit
SW2	ALL OFF 	1 ON 	2 ON 	3 ON 	4 ON 	5 ON 	6 ON 
Unit address & start delay in seconds.	0	1	2	4	8	16	32

### 2-3 Unit control

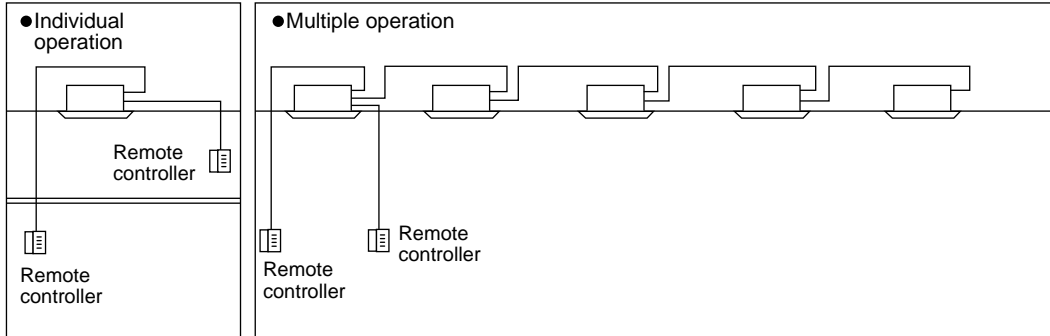
The remote controller can control all units ON/OFF, temperature, air flow, and swing louver. However, the thermostat in each unit turns ON or OFF individually to adjust to the room temperature.

### 3. CONTROL USING TWO REMOTE CONTROLLERS

Two remote controllers can be used to control either one unit or a group of units. Units operate according to the latest command from either of the two remote controllers.

Before operation, be sure to set one remote controller as the “main controller” and the other as the “sub controller”, using dip switch SW17-7 of the remote controller.

**Figure 4**



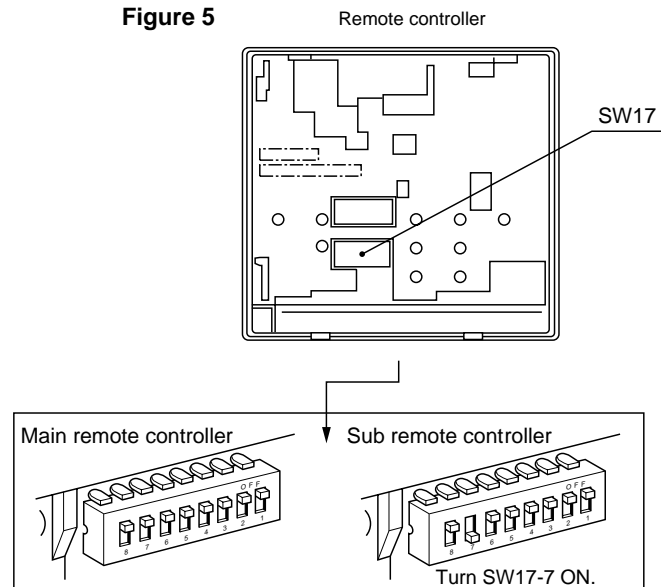
#### 3-1 How to set SW17-7 (See Figure 5.)

- (1) For the main remote controller, turn SW17-7 OFF.
- (2) For the sub remote controller, turn SW17-7 ON.

#### 3-2 Remote controller LCD indication

- (1) The same indications always appear on both the main and sub remote controllers, except during the timer operations.
- (2) Timer operations can be set with either of the two remote controllers. However, LCD indication appears only on the remote controller used for timer-settings.
- (3) If both remote controllers are set for timer operation with different time-settings, the timer operation with the shorter remaining-time is effective.
- (4) Self-diagnostic function is available with either of the two remote controllers. If one of the remote controllers is used for the self-diagnostic function, the other remote controller displays the check mode. If the self-diagnostic function is reset by either of the two remote controllers, both remote controllers are reset.

**Figure 5**



### 4. REMOTE ON-OFF AND INDIVIDUAL REMOTE CONTROLS

This method is available to control one unit or any number of units.

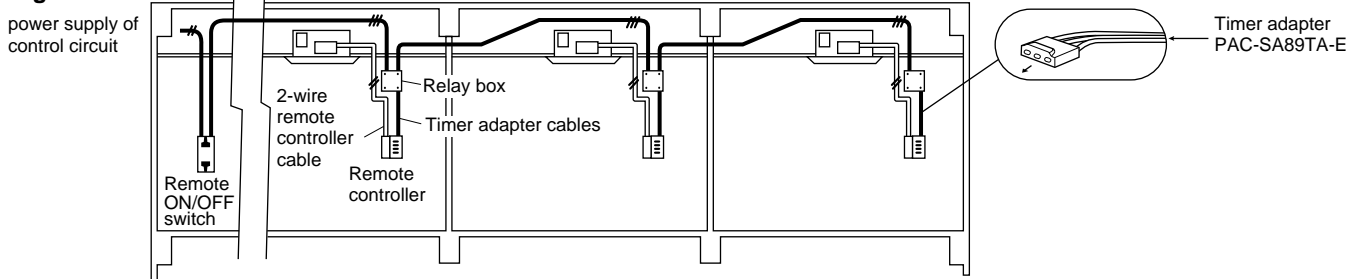
The following operations are available by connecting a relay, a timer adapter (PAC-SA89TA-E), and a remote ON/OFF switch to the system. Timer adapter is an optional part. Other parts are available on the market.

- (A) To start all units in order by remote ON-OFF switch
- (B) To stop all units simultaneously by remote ON-OFF switch
- (C) To switch between the remote ON-OFF control and the individual remote control

#### 4-1 System

Figure 6 shows the case of three units. The same is the case with any number of units.

**Figure 6**



NOTE1 : Install the relay box where it can be serviced easily.

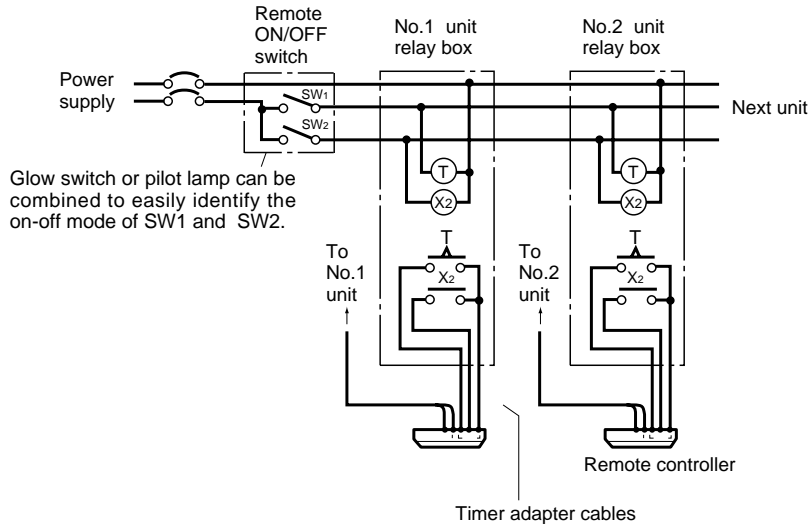
NOTE2 : For control circuit wiring, use a wire of No. 14 AWG or a control cable according to the power supply of control circuit.

NOTE3 : When the power supply of the control circuit is 208/230V AC,

- Do not connect the control circuit wire to the remote controller cable directly.
- Do not place the control circuit wire and the remote controller cable into the same conduit.

## 4-2 Basic wiring

Caution : Before starting all units simultaneously by the remote ON-OFF switch, be sure to connect a sequence-start timer into the remote ON-OFF circuit. Otherwise, a rush of starting current may damage the power supply.



## 4-3 Switch function of remote ON-OFF switch

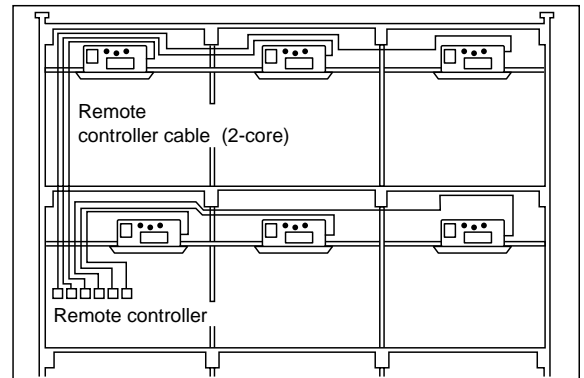
		SW2 (Switches between remote ON-OFF and individual control)	
		ON (Remote ON-OFF control)	OFF (Individual control)
SW1 (Switches between remote ON and OFF.)	ON (Start)	All units start together. ※1 Individual control is not available.	Each unit can be controlled by each remote controller. Remote ON-OFF switch is not available.
	OFF (Stop)	All units stop together. ※2 Individual control is not available.	

※1 After all units start together, if SW2 is turned OFF, each unit can be individually stopped by each remote controller.

※2 After all units stop together, if SW2 is turned OFF, each unit can be individually started by each remote controller.

## 5. INDIVIDUAL CONTROL BY GROUPING THE REMOTE CONTROLLERS

- Grouping the remote controllers allows individual control and centralised monitoring of units installed in different places without a special control board.
- Remote control cables can be extended up to 550yards. When the cable length exceeds 33ft, use the double-insulated two-core cable such as Belden 9407. Also, the cable thickness must be No. 22 AWG or above.
- When gathering the power ON/OFF switches of air conditioners near the remote controllers, you should also install the power ON/OFF switch near each unit to prevent electric trouble during servicing.

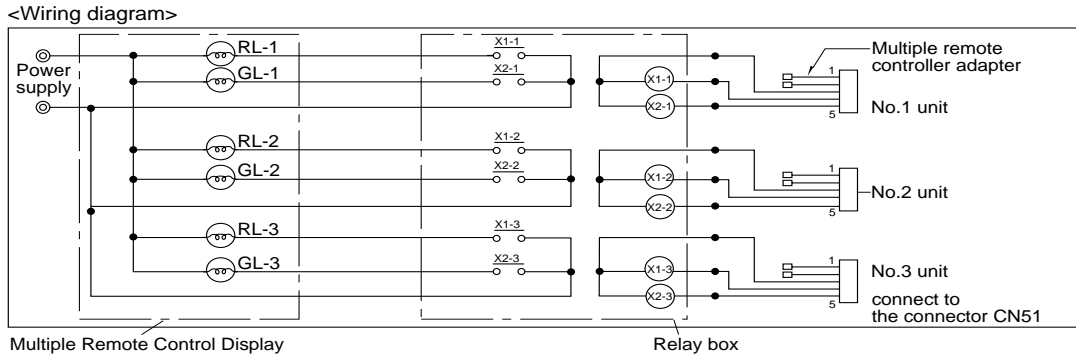
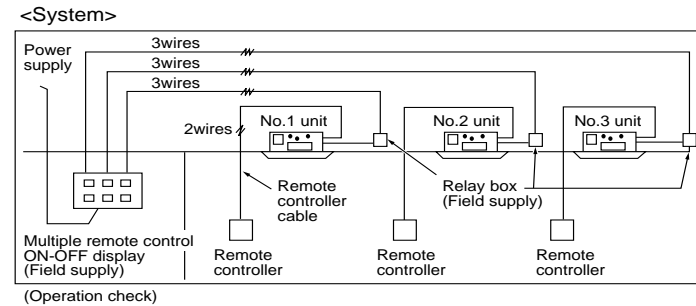
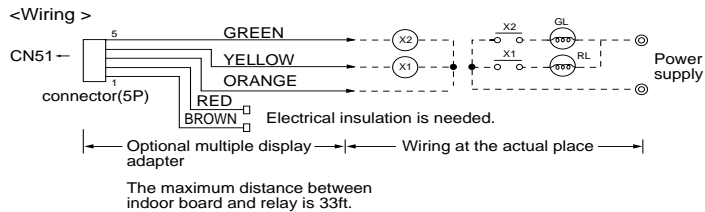


## 6. MULTIPLE REMOTE CONTROL DISPLAY

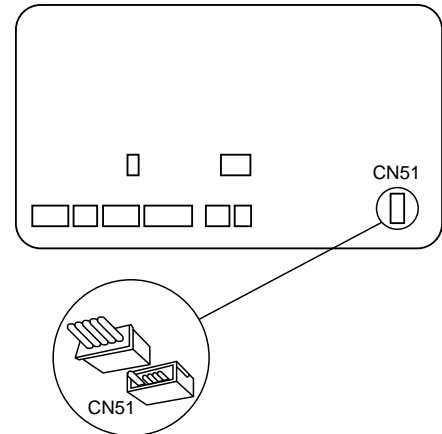
You can control several units with a multiple remote control display, by wiring an optional multiple display adapter (PAC-SA88HA-E) with relays and lamps on the market.

### How to wire

- (1) Connect the multiple display adapter to the connector CN51 on the indoor controller board.
- (2) Wire three of the five wires from the multiple display adapter as shown in the figure below.



Indoor controller board



### [Notes on Signs]

X1:Relay (for operation lamp)

X2:Relay (for check lamp)

RL:Operation Lamp

GL:Check Lamp

[Field supplied parts]

Relays:12V DC with rated coil power consumption below 0.9W.

Lamps:Matching to power supply voltage.

## 7. AUTO RESTART FUNCTION

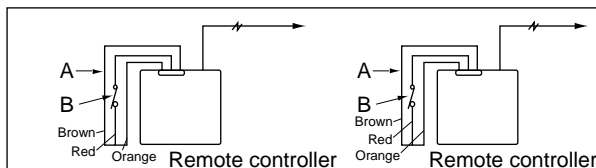
By setting the dip switch SW1-8 to ON, the air conditioner can be started/stopped by power supply ON/OFF.

If the air conditioner is OFF before the power failure, it will not start operation by power restore.

•This function is mainly to emergency performance when the power supply stops temporarily. Therefore, since the protection function (for example, clank case heater and prevention from restarting in 3 minutes, etc.) of the device is not operated, this function should not be used mostly.

## 8. TIMER OPERATION OR THE OPERATION BY AN EXTERNAL SIGNAL

### <Wiring>

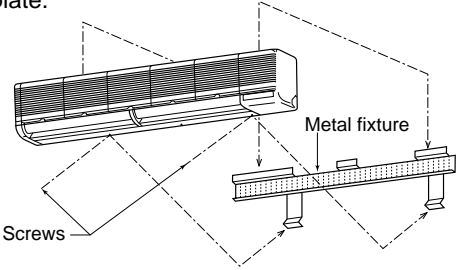
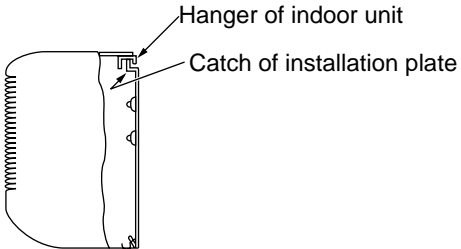
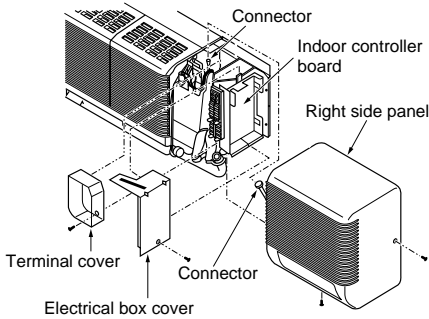
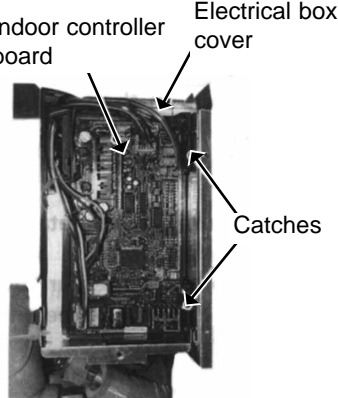
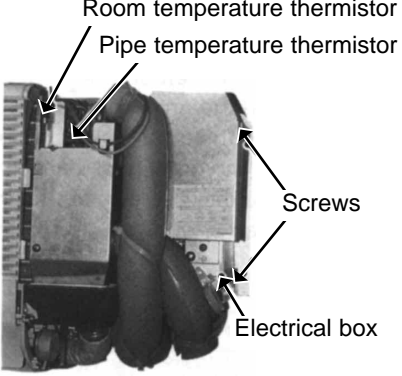


A : an optional timer adapter

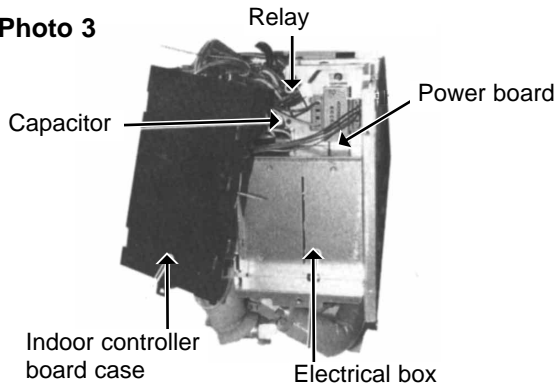
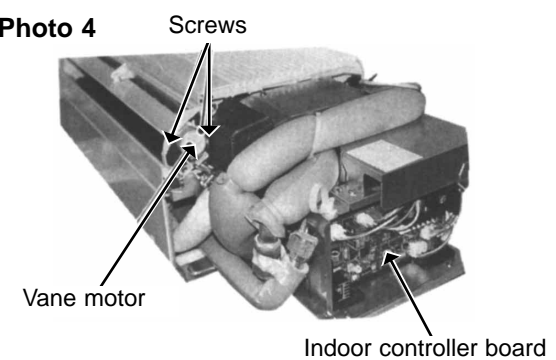
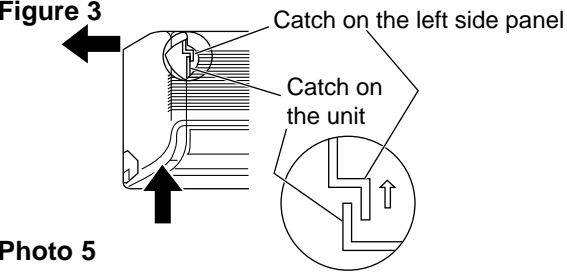
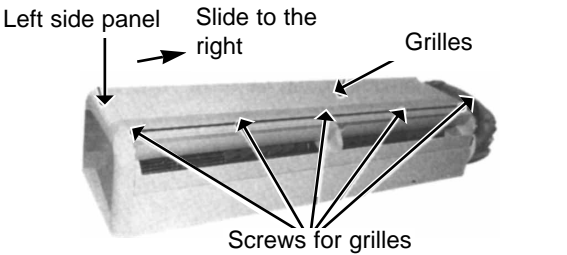
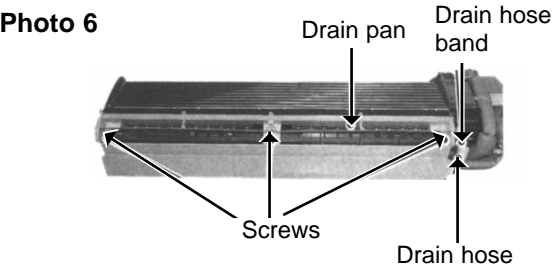
B : a single-throw switch

For remote control, connect the optional timer adapter (PAC-SA89TA-E)

## Indoor unit PKH24FK3

OPERATING PROCEDURE	PHOTOS&ILLUSTRATION
<p><b>1. Removing the lower side of the indoor unit from the installation plate</b></p> <p>(1) Remove the 2 screws. Hang the indoor unit hangers to the catches on the installation plate.</p> 	<p><b>Figure 1</b></p> 
<p><b>2. Removing the right side panel</b></p> <p>(1) Remove the 2 screws of the right side panel: one on the bottom and the other on the upper right-hand side. (2) Disconnect the connector from the adapter case. (3) Sliding the right side panel to the right, pull it out toward you.</p>	<p><b>Figure 2</b></p> 
<p><b>3. Removing the indoor controller board</b></p> <p>(1) Remove the right side panel. (2) Remove the screw of the electrical box cover, and remove the cover. (3) Disconnect the connectors on the indoor controller board. (4) To unhook the catches on the right-hand side of the indoor controller board, pull the left-hand side toward you and lift up the cover to the right. Then the indoor controller board can be removed.</p>	<p><b>Photo 1</b></p> 
<p><b>4. Removing the electrical box</b></p> <p>(1) Remove the right side panel. (2) Remove the screw of the electrical box cover, and remove the cover. (3) Remove the room temperature thermistor and the pipe temperature thermistor. (4) Disconnect the vane motor connector on the indoor controller board. (5) Remove the 2 screws of the electrical box. (6) Disconnect the connector of the heater lead wire connector. (7) Disconnect the connector of the fan motor lead wire. (8) Remove the electrical box.</p>	<p><b>Photo 2</b></p> 



OPERATING PROCEDURE	PHOTOS&ILLUSTRATION
<p>(8) Remove the screws of the indoor controller board case, and pull out the indoor controller board case. Then the transformer and the capacitor and relay can be serviced.</p>	<p><b>Photo 3</b></p> 
<p><b>5. Removing the vane motor</b></p> <ol style="list-style-type: none"><li>(1) Remove the right side panel.</li><li>(2) Remove the screw of the electrical box cover, and remove the cover.</li><li>(3) Remove the 2 screws of the vane motor, and remove the motor from the shaft.</li><li>(4) Disconnect the vane motor connector on the indoor controller board.</li></ol>	<p><b>Photo 4</b></p> 
<p><b>6 Removing the intake grilles</b></p> <ol style="list-style-type: none"><li>(1) Remove the right side panel.</li><li>(2) To remove the left side panel, remove the screw on the bottom and the screw on the upper left-hand side. (See Figure 3.)<ol style="list-style-type: none"><li>1. Press up this side of the left side panel to unhook the catch on the panel from the catch on the unit.</li><li>2. Slide the left side panel to the left to remove the panel.</li></ol></li></ol> <p>Note: Fix the unit to the metal fixture securely</p> <ol style="list-style-type: none"><li>(3) Remove the air filters.</li><li>(4) Hold and press the center cover to remove.</li><li>(5) Remove the screws of the grilles.</li><li>(6) Pull the lower side of the grille toward you and slide the upper to the right to remove the grilles.</li></ol>	<p><b>Figure 3</b></p>  <p><b>Photo 5</b></p> 
<p><b>7. Removing the drain pan</b></p> <ol style="list-style-type: none"><li>(1) Remove the left and right side panels.</li><li>(2) Remove the grilles.</li><li>(3) Remove the electrical box cover.</li><li>(4) Loosen the drain hose band to remove.</li><li>(5) Remove the 3 screws of the drain pan, and slide the drain pan toward you to remove.</li></ol>	<p><b>Photo 6</b></p> 

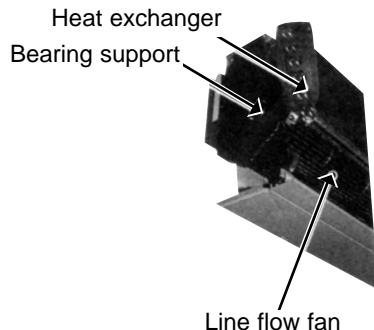


## OPERATING PROCEDURE

### 8. Removing the line flow fan and the fan motor

- (1) Remove the left and right side panels.
- (2) Remove the grilles.
- (3) Remove the electrical box.
- (4) Remove the drain pan.
- (5) Loosen the screw that fixes the line flow fan to the fan motor. (See Photo 7. )
- (6) Remove the 4 screws of the motor fixture, and remove the fan motor and the motor fixture at a time (See Photo 8.)
- (7) Remove the screws of the left and right motor supports, and remove the motor supports and the fan motor. (See Photo 9.)
- (8) Remove the 2 screws on the left and right sides of the heat exchanger, and pull the bearing support toward you. (See Photo 11.)
- (9) Remove the screw of the center support, and remove the support. (See Photo 10. )
- (10) Pull the left-hand side of the heat exchanger toward you, and remove the line flow fan.

**Photo 11**

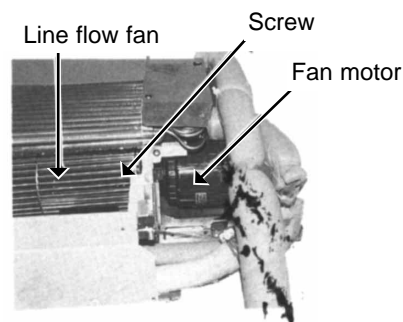


### 9. Removing the electrical heater.

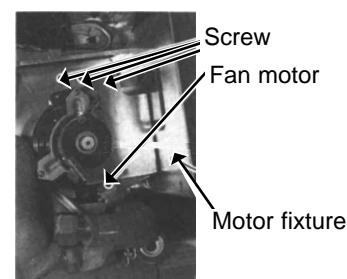
- (1) Remove the left and right side panels.
- (2) Remove the grilles.
- (3) Remove the drain pan.
- (4) Loosen the screw that fixes the line flow fan to the fan motor. (See Photo 7.)
- (5) Remove the screw of the center support, and remove the support. (See Photo 10.)
- (6) Remove the 2 screws on the left and right sides of the heat exchanger, and pull the bearing support toward you. (See Photo 11.)
- (7) Pull the left-hand side of the heat exchanger toward you, and remove the line flow fan.
- (8) Remove the heater fixing screws (1 screw each on right and left sides), and slide the heater element to the left to remove the heater.

## PHOTOS

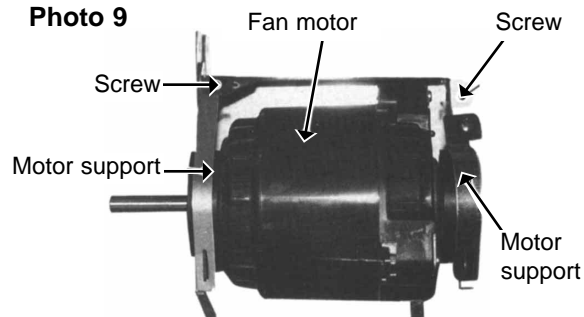
**Photo 7**



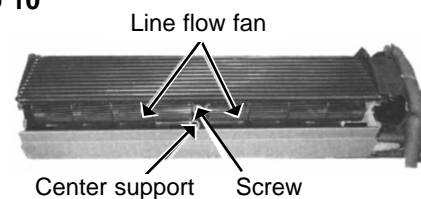
**Photo 8**



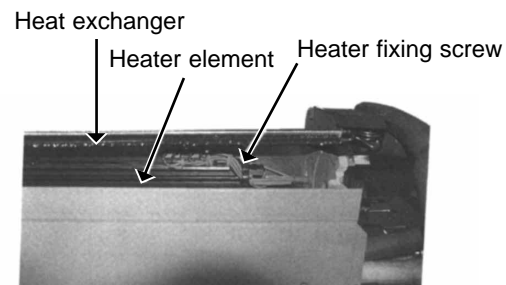
**Photo 9**



**Photo 10**



**Photo 12**



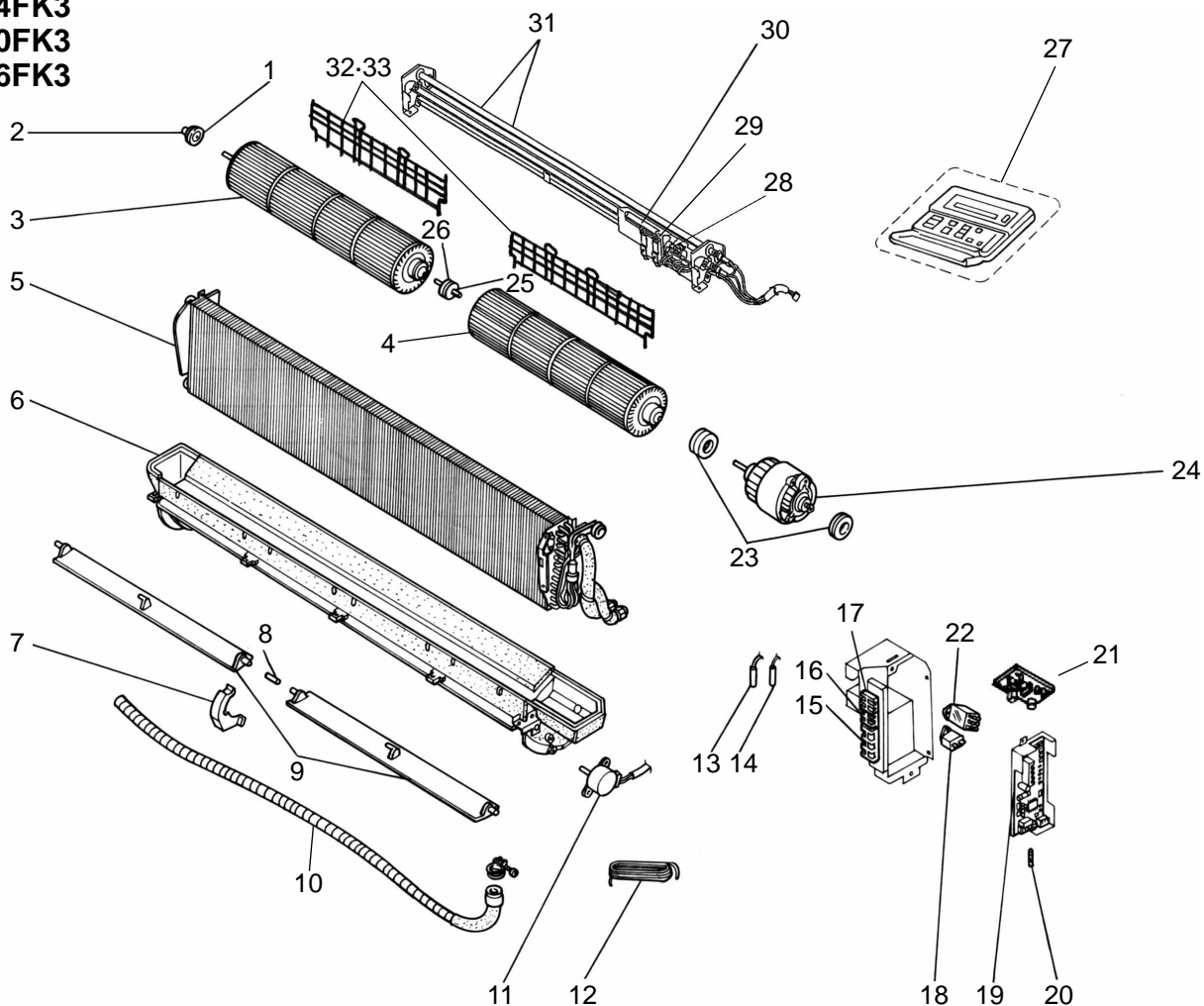
## ELECTRICAL PARTS

PKH18FK3

PKH24FK3

PKH30FK3

PKH36FK3



No.	Parts No.	Parts Name	Specifications	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol
				PKH					
				18 FK3	24 FK3	30 FK3	36 FK3		
1	R01 005 103	SLEEVE BEARING		1	1	1	1		
2	R01 Z61 102	BEARING MOUNT		1	1	1	1		
3	R01 12G 114	LEFT LINE FLOW FAN		1	1				
	R01 16G 114	LEFT LINE FLOW FAN				1	1		
4	R01 12G 115	RIGHT LINE FLOW FAN		1	1				
	R01 16G 115	RIGHT LINE FLOW FAN				1	1		
5	T7W B08 480	HEAT EXCHANGER	Including Restrictor valve • Capillary tube	1					
	T7W B02 480	HEAT EXCHANGER	Including Restrictor valve • Capillary tube		1				
	T7W B09 480	HEAT EXCHANGER	Including Restrictor valve • Capillary tube			1			
	T7W B03 480	HEAT EXCHANGER	Including Restrictor valve • Capillary tube				1		

※ Restrictor valve and capillary tube have been added to "Specifications" of heat exchanger.



No.	Parts No.	Parts Name	Specifications	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol
				PKH					
				18 FK3	24 FK3	30 FK3	36 FK3		
6	T7W E13 529	DRAIN PAN		1	1				
	T7W E14 529	DRAIN PAN				1	1		
7	R01 12G 621	CENTER COVER		1	1	1	1		
8	R01 12G 063	JOINT SHAFT		1	1	1	1		
9	R01 12G 002	AUTO VANE		2	2				
	R01 16G 002	AUTO VANE				2	2		
10	R01 KV5 527	DRAIN HOSE		1	1	1	1		
11	R01 12G 223	VANE MOTOR		1	1	1	1		MV
12	T7W A00 305	REMOTE CONTROLLER CABLE	33ft	1	1	1	1		
13	T7W E12 202	ROOM TEMPERATURE THERMISTOR	ROOM TEMPERATURE	1	1	1	1		RT1
14	R01 E02 202	PIPE TEMPERATURE THERMISTOR	PIPE TEMPERATURE (INDOOR COIL)	1	1	1	1		RT2
15	R01 377 246	TERMINAL BLOCK	3P(L1, L2, GR)	1	1	1	1		TB2
16	R01 998 246	TERMINAL BLOCK	3P(1, 2, 3)	1	1	1	1		TB4
17	R01 556 246	TERMINAL BLOCK	2P(1, 2)	1	1	1	1		TB5
18	T7W E03 255	FAN MOTOR CAPACITOR	2.5μF 440V	1	1	1	1		C
19	T7W E24 310	CONTROLLER BOARD		1	1	1	1		I.B
20	T7W 410 239	FUSE	250V 6A	2	2	2	2		F1.2<l.B>
21	R01 E02 313	POWER BOARD		1	1	1	1		P.B
22	R01 479 215	RELAY	LY1F DC12V			2	2		88H
	R01 673 215	RELAY	LY2F DC12V	1	1				88H
23	R01 12G 105	RUBBER MOUNT		2	2				
	R01 16G 105	RUBBER MOUNT				2	2		
24	T7W B00 762	FAN MOTOR	PN4N45-K	1	1				MF
	T7W B01 762	FAN MOTOR	PN4N70-K			1	1		MF
25	R01 12G 103	SLEEVE BEARING		1	1	1	1		
26	R01 KV5 102	BEARING MOUNT		1	1	1	1		
27	T7W E05 713	REMOTE CONTROLLER		1	1	1	1		R.B
28	R01 12G 706	THERMAL FUSE	243°F 10A 250V	1	1				FS1.2
	T7W 589 706	THERMAL FUSE	243°F 15A 250V			1	1		FS1.2
29	R01 20J 303	INSULATOR		1	1	1	1		
30	T7W B00 700	THERMAL SWITCH		1	1	1	1		26H
31	T7W 587 300	HEATER ELEMENT	240V 700W	3	3				H
	T7W 589 300	HEATER ELEMENT	240V 800W			3	3		H
32	T7W B02 675	FAN GUARD		2	2				
33	T7W B03 675	FAN GUARD				2	2		

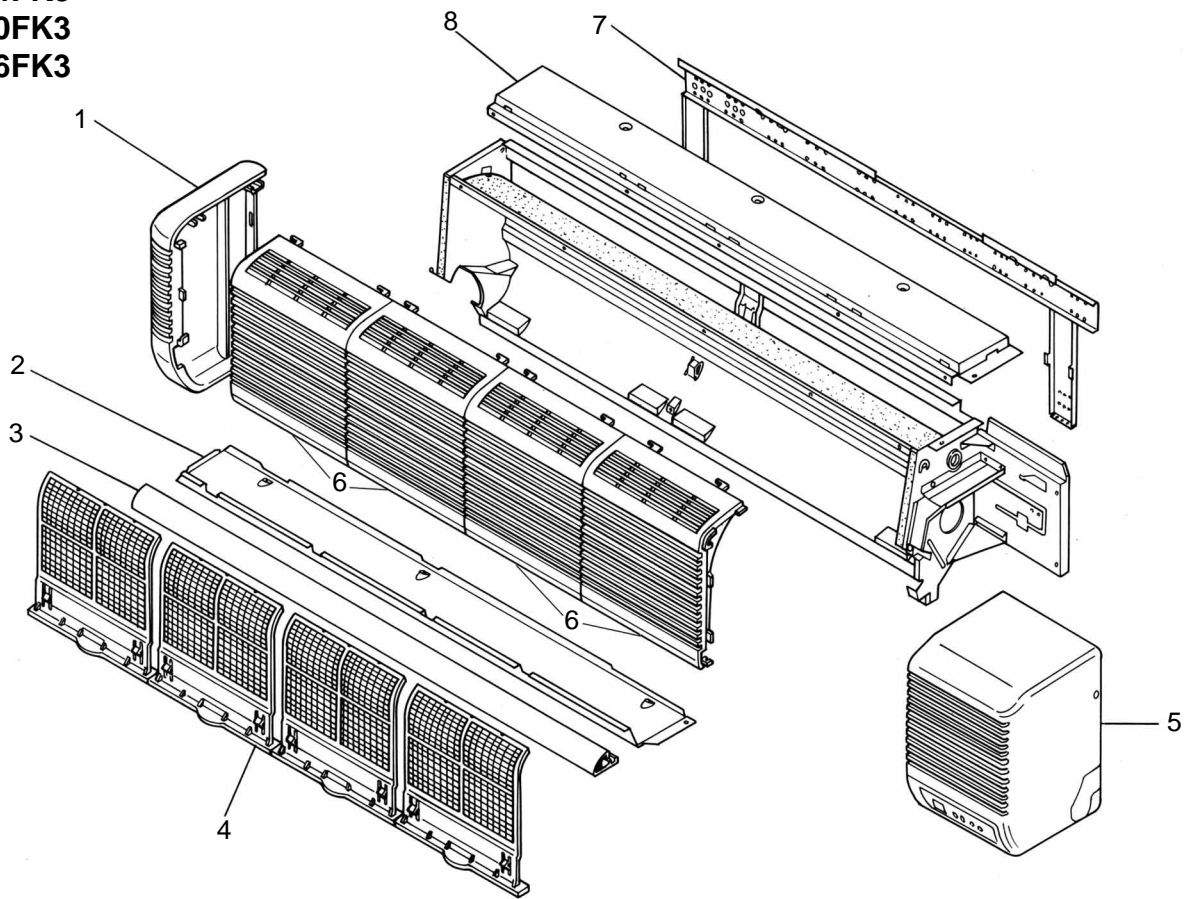
## STRUCTURAL PARTS

PKH18FK3

PKH24FK3

PKH30FK3

PKH36FK3



Part numbers that is circled is not shown in the figure.

No.	Parts No.	Parts Name	Specifications	Q'ty / set				Remarks (Drawing No.)	Wiring Diagram Symbol
				PKH					
				18 FK3	24 FK3	30 FK3	36 FK3		
1	R01 12G 662	LEFT SIDE PANEL		1	1	1	1		
2	R01 E01 812	UNDER PLATE		1	1				
	R01 E00 812	UNDER PLATE				1	1		
3	R01 E00 811	NOSE		1	1				
	R01 E01 811	NOSE				1	1		
4	R01 A17 500	FILTER		4	4	5	5		
5	R01 12G 661	RIGHT SIDE PANEL		1	1	1	1		
6	R01 12G 691	INTAKE GRILLE		2	2	2	2		
7	R01 12G 808	BACK PLATE		1	1				
	R01 16G 808	BACK PLATE				1	1		
8	R01 E01 641	TOP PLATE		1	1				
	R01 E00 641	TOP PLATE				1	1		
⑨	R01 16G 692	INTAKE GRILLE				1	1		
⑩	R01 12G 523	DRAIN SOCKET		1	1	1	1		

## 1. TIMER

When using a program timer, a program timer adapter (PAC-825AD) is also needed.  
(PAC-825AD is included with PAC-SC32PTA.)

Part No.	PAC-SC32PTA (with set back function)
Model Name	Program timer

### 1-1 Program timer specifications

Parts name	Program timer
Parts No.	PAC-SC32PTA
Exterior dimensions (inch)	5-4/32x4-23/32x23/32 (130x120x18mm)
Installation	Wall mount
Type of clock	Quartz
Clock accuracy	±50 second / month at 77°F
Display-Time	Liquid crystal display
-Week	Liquid crystal display
-Timer setting unit	Liquid crystal display
Program cycle	24 hours
Timer setting unit	30 minutes
No. of set points	48 / day
Power rating	5V DC ±5% (Supplied by Remote Controller)

### 1-2 Feature of program timer

#### (1) Daily timer function

Daily timer can be set in 30 minutes units for up to 24 hours.  
Each unit can be set for unit ON, unit OFF, or setback operation.

#### (2) Setback operation (PAC-SC32PT)

Set back operation is useful for reducing running costs

e.g. At a hotel with a 24-hour system

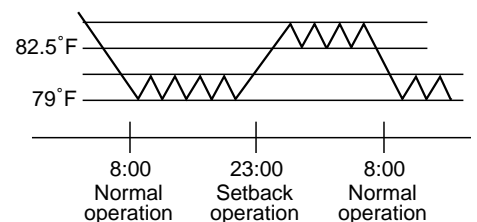
8:00~23:00 Cooling operation with set temperature at 79°F

23:00~8:00 Setback operation with 2 degrees of setback

As shown in the chart on the night, the set temperature rises 2 degrees automatically during the setback operation. When the setback operation ends, normal operation will begin.

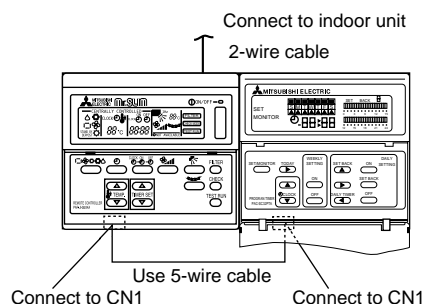
#### (3) Weekly timer function

Daily timer function can apply to each day of the week.



### 1-3 How to connect program timer

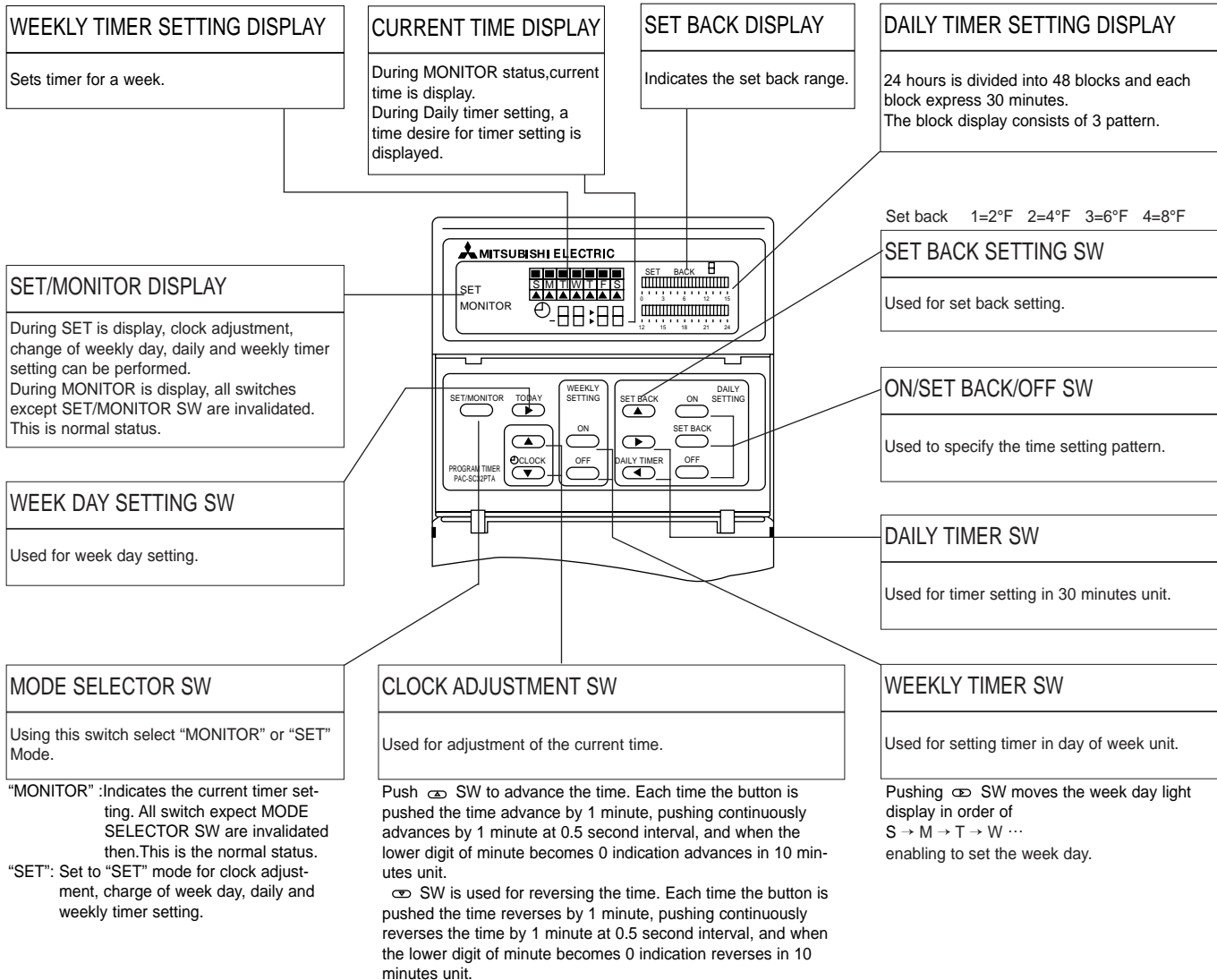
- Install the program timer next to the remote controller the same way as the remote controller is installed.
- Connect the program timer and the remote controller with a 5-wire cable as shown in the figure below



NOTE: While the program timer is connected to the remote controller, the 24hour ON/OFF timer on the remote controller will not operate.

## 1-4 Names and functions

<PAC-SC32PTA>





Mr.SLIM™







# **MITSUBISHI ELECTRIC**

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